

The
Communicator

November/December 2019



SARC



A Publication Of Surrey Amateur Radio Communications



PUBLICATION CONTACTS

**COMMUNICATOR
& BLOG EDITOR** John Schouten VE7TI
[communicator at ve7sar.net](mailto:communicator@ve7sar.net)

SARC TELEPHONE (778) 683-4662

CORRESPONDENCE 12144 - 57A Avenue
Surrey, BC V3X 2S3
[SARC at ve7sar.net](mailto:SARC@ve7sar.net)

CONTRIBUTING EDITORS John Brodie VA7XB
Kevin McQuiggin VE7ZD

The Communicator is a publication of Surrey Amateur Radio Communications.

It appears bi-monthly, on odd-numbered months, for area Amateur Radio operators and beyond, to enhance the exchange of information and to promote ham radio activity.

During non-publication months we encourage you to visit the Digital Communicator at ve7sar.blogspot.ca, which includes recent news, past issues of The Communicator, our history, photos, videos and other information.

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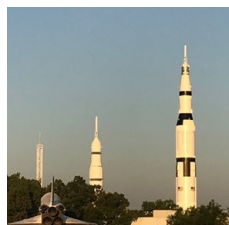
SARC maintains a website at www.ve7sar.net

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***The GNU radio Conference—
Huntsville, Alabama***



Installing A Mobile Transceiver

John Brodie writes about the tricks to achieving a perfect mobile installation.

Two Antennas

One VHF-UHF, one HF. Effective, yet simple and inexpensive.





QRM

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...from the Editor's Shack

*Do you have a photo or bit of SARC news to share?
An Interesting link?*

*Something to sell or something you are looking for?
eMail it to [communicator at ve7sar.net](mailto:communicator@ve7sar.net) for inclusion in this publication.*

Welcome to the second issue of our 2019-2020 season. Going bi-monthly has provided an opportunity to write more 'home-grown' articles, a trend I hope to be able to sustain. Again this issue we have a number of projects for both advanced and beginner hams.

There are two antenna projects in this issue, one for the 2m-70cm crowd, and one geared to HF use. The first is a short flagpole version of the dual-band roll-up J-pole we build in our SARC Basic class. This antenna will bring much greater range to those who have problems communicating with our, or other, repeaters.

The second is based on Hamsticks, low cost elements that can be used in either a single or dipole horizontal or vertical configuration. Reasonably low cost and they work in very little space.

Our Basic course has started. We launched the Fall course with almost 30 registrants on October 8th in the new

Surrey Fire Services Training Centre, a beautiful state-of-the-art facility.

Our VE7SAR station move is still on hold pending a relocation option from the City of Surrey. Stay tuned as developments are happening.

In Radio Ramblings, Kevin McQuiggin writes this month about his recent trip to the GNUradio conference in Huntsville, Alabama. As you may recall, Kevin presented an informative talk about open source (as in free) GNU radio at a SARC monthly meeting, followed by a Saturday morning hands-on workshop where we all built a working FM receiver. Lots of interesting potential here!

We are looking for a SARC Net Manager. Its not a difficult job and, if you have some time to spare, we'd like to hear from you. Basically it involves scheduling someone to do the Tuesday evening weekly net.

~ John VE7TI
Communicator Editor

This Month's Cover...

At the September meeting, Lavina Shaw brought us back to the age when telegraphy was the fastest method of communications. She tells fascinating stories of her career as a commercial telegrapher, starting when she first learned to code at age 10. Her story is profiled this issue.



"Despite the high cost of living, it remains popular"

On the Web ve7sar.net

Between newsletters, watch your e-mail for news, announcements of Amateur Radio events, monthly meetings and training opportunities.

Click the links below to follow our presence on the web and social media:

SARC Blog
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FaceBook
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Our YouTube Channel
[SurreyARC](https://www.youtube.com/SurreyARC)

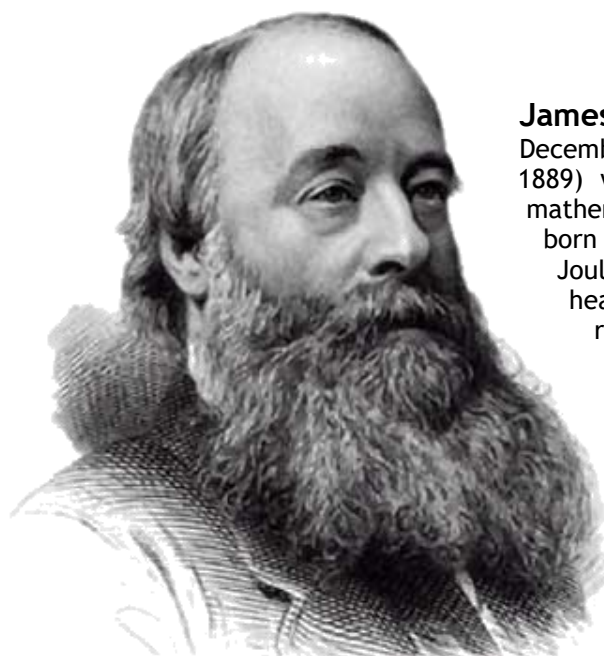
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The Rest Of The Story...

James Joule



James Prescott Joule (24 December 1818 - 11 October 1889) was an English physicist, mathematician and brewer, born in Salford, Lancashire.

Joule studied the nature of heat, and discovered its relationship to mechanical work. This led to the law of conservation of energy, which in turn led to the development of the first law of thermodynamics.

The SI derived unit of energy, the joule, is named after him.

newly invented electric motor. His first scientific papers on the subject were contributed to William Sturgeon's *Annals of Electricity*. Joule was a member of the London Electrical Society, established by Sturgeon and others.

Motivated in part by a businessman's desire to quantify the economics of the choice, and in part by his scientific inquisitiveness, he set out to determine which prime mover was more efficient. He discovered Joule's first law in 1841, that the heat which is evolved by the proper action of any voltaic current is proportional to the square of the intensity of that current, multiplied by the resistance to conduction which it experiences. He went on to realize that burning a pound of coal in a steam engine was more economical than a costly pound of zinc consumed in an electric battery. Joule captured the output of the alternative methods in terms of a common standard, the ability to raise a mass weighing one pound to a height of one foot, the foot-pound.

However, Joule's interest diverted from the narrow financial question to that of how much work could be extracted from a given source, leading him to speculate about the convertibility of energy. In 1843 he published results of experiments showing that the heating effect he had quantified in 1841 was due to generation of heat in the conductor and not its transfer from another part of the



He was fascinated by electricity, and he and his brother experimented by giving electric shocks to each other and to the family's servants.

James Joule was born in 1818, the son of Benjamin Joule (1784-1858), a wealthy brewer, and his wife, Alice Prescott, on New Bailey Street in Salford. Joule was tutored as a young man by the famous scientist John Dalton and was strongly influenced by chemist William Henry and Manchester engineers Peter Ewart and Eaton Hodgkinson. He was fascinated by electricity, and he and his brother experimented by giving electric shocks to each other and to the family's servants.

As an adult, Joule managed the brewery. Science was merely a serious hobby. Sometime around 1840, he started to investigate the feasibility of replacing the brewery's steam engines with the

equipment. This was a direct challenge to the caloric theory which held that heat could neither be created or destroyed. Caloric theory had dominated thinking in the science of heat since introduced by Antoine Lavoisier in 1783. Lavoisier's prestige and the practical success of Sadi Carnot's caloric theory of the heat engine since 1824 ensured that the young Joule, working outside either academia or the engineering profession, had a difficult road ahead. Supporters of the caloric theory readily pointed to the symmetry of the Peltier-Seebeck effect to claim that heat and current were convertible in an, at least approximately, reversible process.

At the second International Electrical Congress, on 31 August 1889, the joule was officially adopted alongside the watt and the quadrant (later renamed to henry). Joule died in the same year, on 11 October 1889. At the fourth congress (1893), the "international Ampere" and "international Ohm" were defined, with slight changes in the specifications for their measurement, with the "international Joule" being the unit derived from them.

~



A Joule is the energy dissipated as heat, when an electric current of one ampere passes through a resistance of one ohm, for one second.

One joule in everyday life represents approximately:

- The energy required to lift a medium-sized tomato up 1 metre (3 ft 3 in) (assume the tomato has a mass of approximately 100 grams (3.5 oz)).
- The energy released when that same tomato falls back down one metre.
- The energy required to accelerate a 1 kg mass at $1 \text{ m} \cdot \text{s}^{-2}$ through a distance of 1 m.
- The heat required to raise the temperature of 1 g of water by 0.24°C .
- The typical energy released as heat by a person at rest every $1/60 \text{ s}$ (approximately 17 ms).
- The kinetic energy of a 50 kg human moving very slowly (0.2 m/s or 0.72 km/h).
- The kinetic energy of a 56 g tennis ball moving at 6 m/s (22 km/h).
- The kinetic energy of an object with mass 1 kg moving at $\sqrt{2} \approx 1.4 \text{ m/s}$.
- The amount of electricity required to light a 1 W LED for 1 s.

Since the joule is also a watt-second and the common unit for electricity sales to homes is the kWh (kilowatt-hour), a kWh is thus $1000 \text{ W} \times 3600 \text{ s} = 3.6 \text{ MJ}$ (megajoules).

Radio Ramblings

Kevin McQuiggin VE7ZD/KN7Q

The 2019 GURadio Conference – Huntsville, Alabama



I attended the annual *gnuradio* technical conference in Huntsville, AB in September. This month I'll summarize the conference, the talks, and recent developments in SDR and *gnuradio*.

Background

Readers of this column will remember that I am a user of *gnuradio*, an open source software radio development platform. *Gnuradio* [1] uses a friendly graphical user interface to help users quickly build both receivers and transmitters in software. You build a software radio from “blocks” such as modulators, demodulators, filters, and other components. It is sort of like designing a radio at the “block diagram” level.

You need a bit of hardware to actually receive or transmit the signal generated by *gnuradio*. For building a receiver, a \$20 USB “rtl-sdr” dongle will usually suffice [2]. If you are designing a transmitter, several USB-based transceivers are available ranging in price from around \$100 to more than \$1000 for the most sophisticated units [3].

Gnuradio has a bit of a learning curve, but its capabilities are “all powerful” in the digital radio realm, and it can be

used for devices as simple as CW or RTTY receivers or transceivers up to homebrew cellular telephone base stations or spread spectrum satellite transceivers. *Gnuradio* is used by an estimated one hundred thousand amateur radio operators, engineers, researchers, and companies around the world.

The Annual Conference

Each summer and fall, *gnuradio* enthusiasts come together in the US and Europe to review the most interesting projects of the past year, listen to technical talks about digital radio, attend workshops, and to discuss the future of the *gnuradio* package. I have attended three of the last four US conferences, which are held in September and usually alternate between the west and east sides of the country. I always come away from the conference with some ideas for challenging new radio projects.

This year the conference was held in Huntsville, Alabama at the Marriot Hotel beside NASA's Marshall Space Flight Centre. Over 400 scientists, hobbyists, and researchers from around the world attended. Now re-christened as the “US Space and Rocket Center”, NASA Marshall was responsible for the development of the Saturn V rocket of 1960s “Apollo” fame, and was home to Dr. Werner von Braun and his team of German rocket



Figure 1 - View from My Hotel Room

scientists after they surrendered to Allied forces at the end of WWII in 1945.

The topic of amateur radio arose often at this year's conference, and a show of hands during the week determined that about forty percent of the attendees were hams.

The Talks

The theme of space exploration and communication with spacecraft was front and centre in this year's conference.

One of the best talks was on the subject of mission control's communication with the Apollo missions to the moon in the late 1960s/early 1970s. It was led by Dr. Robert Suggs KB5EZ of NASA and described an incredibly sophisticated global telecommunications system which was able to relay routine and secure voice communication, television signals, medical telemetry, and critical spacecraft telemetry from the earth to the moon and back via NASA's DSN (Deep Space Network) and a sophisticated network of earth-based radio and telephone circuits.

Interestingly, in addition to an array of VHF, UHF, and microwave radios and antennas, the Apollo telecommunications system supported a couple of "emergency modes" for use should one of the three spacecraft components (command module, lunar module, or service module) suffer a communications failure enroute to, or at, the moon. Rob described the several backup systems in detail, as well as the "ultimate" fallback method: CW, which would be transmitted by the astronauts via an "emergency hand key" if all the other communications systems failed. Astronauts of the Apollo era had to be able to send and receive Morse code.

Rob's talk concluded with a discussion of the sophisticated communications systems and protocols which are going to be used in NASA's planned return of astronauts to the moon by 2024, at a planned moon base, and on from there

to Mars in the 2030s. It will be possible to use gnuradio to design receivers that monitor a fair amount of these communications directly.

Another interesting talk was given by a Spanish mathematics professor and amateur Daniel Estevez EA4GPZ on his development of a free gnuradio module called "gr-satellites" [4].

Modules can be easily linked into simpler gnuradio programs to add complex functions to them with minimal difficulty. Modules (called "hierarchical blocks" in gnuradio parlance) are great tools for new users.

The gr-satellites module contains SDR flowgraphs which decode telemetry from 85 different amateur and other popular satellites. Daniel's goal is to develop decoders for every free-access satellite, and he has put significant effort into this project over the past couple of years. He demonstrated several of his decoders, covering most of the active international AMSAT/OSCAR satellites as well as weather satellites from NOAA and other nations.

As readers may recall, I developed an L-band (~1500 MHz) Inmarsat telemetry decoder a couple of years ago using gnuradio and demonstrated it at one of our monthly club meetings. I spoke to Daniel about this: he doesn't have an Inmarsat decoder yet in gr-satellites, so one of my projects this year is to re-package my decoder as a module so that Daniel can include it in a future release of gr-satellites. It's fun to "give back" to the community.

Dr. Steve Croft of UCB (the University of California at Berkeley) gave a very detailed overview of the "Breakthrough Listen" project. This is a US federally- and privately-funded partnership in SETI (the Search for Extra-Terrestrial Intelligence). Steve is a radio astronomer with the project and is based at the University of California at Berkeley (UCB). The specifications for the project are impressive. Breakthrough Listen will look at the 1,000,000 closest stars for signs of radio and laser signals

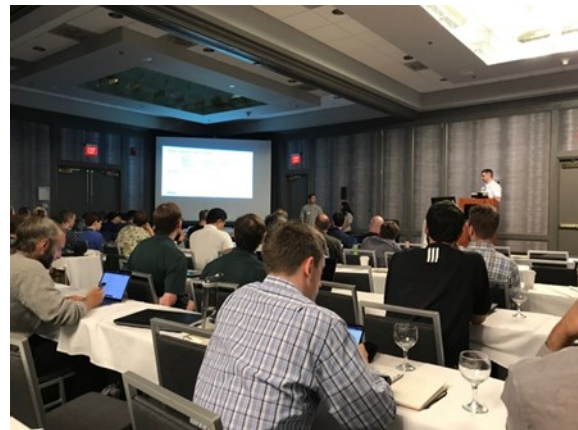


Figure 2 - Attendees at Work

and will be 1000 times more effective in this search than any other SETI project to date [5]. Steve provided a fascinating update (with great photos) on the massive antenna arrays and broadband receivers being used for this effort. A lot of the project participants are hams. Unfortunately, the project hasn't detected "ET" yet!

An independent researcher named Mike Proscio KC3ERG gave an interesting talk on satellite monitoring with gnuradio, and later presented an afternoon workshop on satellites and space communications for interested attendees. Mike has converted a lot of older gnuradio demodulator blocks to ensure that they work with the current release of gnuradio, version 3.8.

Another very interesting presentation was on artificial intelligence (AI) as applied to the field of radio communications. Dr. Adam L. Anderson of the Oak Ridge National Lab and his team developed a structurally fairly simple machine learning platform, interfaced this platform to a transceiver that operated around 2.4 GHz in the ISM band, and then "taught" the platform to recognize basic radio signals by showing it examples of different types of modulation, different protocols, and a variety of error correcting codes. They then released two of these AI platforms "into the wild" in their research lab to work on its own towards the goal of establishing communication with each other.

The two AI devices stumbled around on the 2.4 GHz ISM band for several hours, transmitting randomly before they "found" one another and established a communications link. The two devices (amazingly) then worked out their own modulation scheme and developed their own protocol for exchanging data. The devices chatted away on their own for a few days as researchers monitored.

The communications scheme developed by the two devices turned out to be more efficient than the standard modulation formats and protocols that are commonly deployed by "biological computers" like us. This is intriguing, and maybe even a little scary!

The researchers then deployed a third platform as a "newbie" into the mix, and

between the three units they all discovered each other and happily integrated the third device into their network.

The performance (i.e. the throughput and bit error rate) of the AI network was quite good. Researchers admit that they don't really understand how the machines established their links, or why they chose the particular modulation scheme that they did, which as noted above would never have been thought of by human engineers. More to come from this interesting field.

The full set of conference talks, including presentation slides and videos, is available on the gnuradio website at <https://www.gnuradio.org/grcon/grcon19/presentations/>

Workshops

The gnuradio conference always includes several three- or four-hour workshops on various technical aspects of SDR, and on new SDR radios and development platforms.

This year at the conference there were a couple of workshops on developing gnuradio flowgraphs (digital radios) that run directly *in hardware* on the radio transceiver, rather than as a program on your personal computer that is connected to the transceiver via USB. This approach greatly improves the performance of your radio application as you don't need a computer to run it: the computer is integrated with the radio on the same PCB. This means, in effect, that the gnuradio flowgraph runs directly on the radio; no computer needed!

Open source compilers are used to convert your desktop gnuradio application to a format that can be installed in an FPGA (Field Programmable Gate Array) directly on the radio platform. Some modifications to your flowgraph are required to allow this, and the workshop walked students through the process.

This is quite a complicated process and I don't have any experience with it yet, but I acquired a small FPGA development board and would like to experiment with the approach over the winter months. It is important for us as hams to keep up with the latest developments in technology.

I attended a great workshop put on by Analog Devices (the creator of the wireless chips used in just about every cell phone and other wireless device) on a fairly new SDR educational device that they have created called the “Pluto” [6]. The Pluto is a digital transceiver that operates from 325 to 3800 MHz. It is a 12-bit unit, so that makes it 16 times more sensitive (or more precise) than the popular 8-bit RTL dongles. Plus, the Pluto can transmit at up to 7 dBm (about 5 milliwatts), enough to send a signal around your shack or throughout your house; or even to feed an amplifier or transverter. The Pluto talks to your computer via USB.



Figure 3 – The Pluto SDR Module

In the workshop students got the provided demo units interfaced to their personal laptops, loaded the appropriate drivers (Windows; Linux, MacOS), and developed a few flowgraphs in gnuradio using Analog Devices’ custom gnuradio Pluto blocks. These blocks are part of a standard block set for gnuradio called gr-iio.

The device worked very well, and I liked the fact that it is a simple and inexpensive way to get started with designing transmitters or receivers in gnuradio. The Pluto’s list price is US\$149, but they are often on sale for as low as US\$99 through online suppliers such as Digi-Key and Mouser [7].

In the online documentation from Analog Devices I also found directions on how to increase the tuning range of the Pluto from the standard 325-3800 MHz to cover all the way from 70 MHz to 6.8 GHz. The popular rtl-sdr website also has directions for this modification at [8]. This modification doesn’t involve any hardware changes: rather, you just connect to the Pluto via its built-in network port and change a couple of parameters. This degrades the unit’s performance a bit, but it is still superior to a low-cost RTL dongle.

Students were fortunate in that at the end of the workshop the Analog Devices instructors told us that we could all keep our demo units! Therefore, I have a nice new SDR for the shack, and in fact have already experimented with the Pluto further at home and developed a short-range FM transmitter.

The final “workshop” I attended was a free amateur radio exam session put on by a local FCC VE (Volunteer Examiner) team from the Huntsville area. The US\$10 exam fee was covered by the gnuradio conference for any attendee who wanted to sit for a US ham license. Demand was high and about 60 attendees sat for their exam. The examiners ran out of space in the testing room and had to create a waiting list. The gnuradio project team recognizes the important role that amateur radio plays in innovation and radio research, and the conference organizers (most of whom are hams) have supported this free exam session at the event for several years.

I am proud to report that I passed my US “Extra” exam. It is always nice to test one’s knowledge and earn a new qualification. The ARRL’s “Extra Class License Manual” [9] helped me, and some late-night cramming focusing on the differences between Canadian and US amateur radio bandplans and regulatory differences paid off. I’ll now be KN7Q whenever I operate in the United States.

Special Event Station



Figure 4 – Special Event Station N4G

The Huntsville Amateur Radio Club operated a special event station N4G (grid EM64pj) for the final three days of the conference. They were on SSB and FT8 on HF and 6 metres. One of the conference organizers, Steve Conklin AI4QR has a Flex 6700 radio and deployed some computers at the conference to allow his home station to be operated remotely.

While club volunteers including Steve W4PPC staffed the station, guest operators were welcomed, and several hams at the conference took the opportunity to operate N4G. Notable for the distance that he had travelled to the conference was Mr. Toshiyuki Urakami JP1PZE (also K7XF) who had travelled to the conference from his home in Japan.



Figure 5 – JP1PZE

Social Events

The conference sponsored some fun social events in the evenings, but the highlight of the week was a dinner in the Marshall Space Flight Center's huge museum hall right next door to the hotel. Under an impressive ceiling-mounted 363-foot long Saturn V rocket, the conference attendees socialized over dinner and some beverages.

I had never seen a Saturn V before other than in the popular television clips of Apollo launches in the 60s/70s. It was amazing to see this famous rocket “in person”. The Saturn V on display in the museum hall did not fly, but rather was an engineering test

unit used by Dr. von Braun and his team for testing prior to the manufacture of the flight-ready rockets. Nonetheless, it was impressive.



Figure 6 – Saturn V Rocket and Delegates

Surrounded by significant space memorabilia such as the Apollo 16 command module, some Gemini hardware, several rocket engines, and a real “moon rock”, attendees networked and “nerded out” with talk of radio, SDR and computing. Many important US government agencies had representatives at the conference, and I had an interesting discussion with the other fellows at my table, who I surmised were using gnuradio to research more effective forms of secure communications.



Figure 7 – Apollo 16 Command Module; Moon Rock

I excused myself early, however, as I had an exam in the morning and returned to the hotel to study!

Cost

A lot of folks balk at attending conventions and conferences due to the perceived high cost. While attendance at conferences is not cheap, with advance planning for travel and lower early registration fees, the cost can be minimized to the point of being reasonable for most of us.

The gnuradio conference registration included daily breakfast, lunch, morning and afternoon snacks, and unlimited free coffee/tea/juice/water/pop throughout the day. The food quality and quantity was great. Transportation costs were nil as the conference was held at the hotel, and the hotel provided a free shuttle to and from the Huntsville airport.

My total expenditures (US dollars):

- Early registration: \$400
- Airfare: about \$500
- Hotel (conference rate): about \$600
- Dinners and miscellaneous expenses: about \$200

Total: about US\$1700 for the week

I must admit that I also bought a few nice rocket-themed T-shirts at the Marshall Space Flight Centre gift shop!

Conclusion

The conference was excellent, the talks informative, the attendees friendly, and I learned a lot about both gnuradio and leading-edge new radio technologies. I would highly recommend attending conferences in areas of your personal interest. With advance planning and early booking, costs are lower than you might think and will not “break the bank”.

I am already looking forward to next year’s conference, which will be held in Raleigh, North Carolina.

That’s it for this month! Feedback can be directed to the Editor, or directly to me at mcquiggi@sfu.ca. 73,

~ Kevin McQuiggin VE7ZD / KN7Q

References:

- [1] See <https://gnuradio.org>
- [2] See <https://rtl-sdr.com>
- [3] For example, the “HackRF” at <https://greatscottgadgets.com/hackrf/> or the “Airspy” at <https://airspy.com>; or the “Ettus” series of devices at <https://ettus.com>. In the article I describe a fairly new device from Analog Devices called the “Pluto”. See <https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/ADALM-PLUTO.html>
- [4] See Daniel’s website and repository at <https://github.com/daniestevez/gr-satellites>.
- [5] See the project website at <https://breakthroughinitiatives.org/initiative/1>.
- [6] See <https://www.analog.com/en/design-center/evaluation-hardware-and-software/evaluation-boards-kits/adalm-pluto.html>.
- [7] The Pluto is currently US\$142.50 at Mouser. See <https://mouser.com>.
- [8] See <https://www.rtl-sdr.com/adalm-pluto-sdr-hack-tune-70-mhz-to-6-ghz-and-gqrx-install/>.
- [9] Available at <https://amazon.com>. ISBN 978-1625950550.

VECTOR 2m QSO Party

Hiroshi Takahashi

2m QSO Party - 16 Nov 2019

VA7LET

Here is an informal contest that all of us can participate in, no matter what level license you have.

How often has a member said that they would like to participate in a QSO party, but cannot do HF at their QTH? Here is a way they can join us, on 2m!

Nov 16th 2019, Saturday, from 10:00-14:00 PST, let's have a Party on 2m. Use a simplex frequency between 146.415 and 147.570 MHz, with PL 88.5 Hz to make as many contacts as possible. The reason for the PL, is to give operators a reason to use VFO mode, to learn some more features of their radio (Generic instructions provided below).

This contest is open to all certified amateurs. Each QSO must have one station within Metro Vancouver, Vancouver and Gulf Islands, Southwest BC (Grids CN89 and CN99) or Northwest WA (only Grid Squares along the Canada-USA border: CN78, CN88, CN98) in order to be considered for points.

- Radios will be classified by power as QRP (10w or less), LOW (11-49w), HIGH (>50w)
- Points will be given for the correct exchange of Callsign, Power class, Municipality.
- Stations may be MOBILE (calling from multiple Municipalities), or FIXED (one Municipality).

Each station worked is worth one point. A Fixed station may be worked only once, while a Mobile station may be worked more than once if it has moved to a different

Municipality. 10 bonus points for each municipality that you work. 10 bonus points for each municipality you transmit from. (Shhhhhh, your first contact is worth 21 points (10+10+1 points)).

Operating -

1. switch radio into VFO mode (V/M button on many radios),
2. change frequency to a frequency listed below,
3. Turn on the Tone mode (not CTCSS)
4. in the menus set the PL tone to 88.5 Hz.

Valid operating frequencies include 146.415, 146.430, 146.445, 146.460, 146.475, 146.490, 146.505, 146.535, 146.550, 146.565, 146.580, 146.595, 147.420, 147.450, 147.480, 147.510, 147.540, 147.570 MHz (ref: <https://wp.rac.ca/144-mhz-2m-page/>)

Electronic log files to be submitted in XLS or gsheets format to qsoparty@vectorradio.ca by Nov 30, to be included in the scoring. No prizes will be awarded, but lots of admiration from your peers. Info package: https://drive.google.com/drive/folders/1lki0Y_q0PpisrDkqXQk0HnPoviQyzMro?usp=sharing

For further information, contact hiroshi.takahashi@vectorradio.ca

~ Hiroshi Takahashi VA7LET
VECTOR VHF Contest Manager

Page 13—News You Can Lose

The Lighter Side of Amateur Radio

Portable Operations?



When using this "Belt- Radio" the wearer is quite unmindful that the latest news or dance music is coming from an ultra- midget receiver which is actually being worn on the belt! And it takes only a minute to put the whole equipment on -and less to take it off! Technical men will better appreciate the amazing sensitivity of this tiny set, with its "hat" antenna, on being told that the writer has had no difficulty in receiving WCAI (Philadelphia) and WHAM (Rochester), on the 5th floor of a 14 -story all -steel building in mid- Manhattan! The circuit is fundamentally a regenerative detector followed by 2 stages of audio amplification. A closer inspection, though, will reveal that the gridleak- and -condenser combination is arranged in an unusual manner- across the tuning coil and in series with the variable condenser (C1) . This was found to give far better results with a closed antenna circuit of the type used than the more conventional method, and also enabled absolute stability to be obtained with the minimum of bypassing and shielding. In fact no shielding at all was used. Finally, there is not the slightest trace of hand- capacity effect to upset the tuning on the 200 to 550 meter range (broadcast band).

There are one or two important points to remember. The loop aerial was designed to fit 'round the head because that was found to be the only position in which it gave satisfactory results. On the back it was too close to the body and when the receiver was in its most sensitive state (just before circuit oscillation) every movement of the body upset tuning and regeneration. But, unfortunately, there is one disadvantage in having the aerial placed that way. The 4 -ft. cable connecting it with the receiver acts as a capacity and restricts the tuning range of the set.

~ Radio-Craft Magazine
December 1936

November 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
For details on all SARC events, go to ve7sar.net For details on all SEPARS events, go to separ.shutterfly.com/calendar						
					1	2 08-1000 SARC Social: Kalmar Family Restaurant 8076 King George Blvd, Surrey, BC
3 Maple Ridge Swap Meet - 9 am; Pancake breakfast 8 am. 12460 Harris Road.	4	5 1930 SEPAR Net 2000 SARC Net SARC Basic Course	6	7	8	9 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: WAE DX (RTTY)
10 CONTEST: WAE DX (RTTY)	11 	12 1930 SEPAR Net 2000 SARC Net SARC Basic Course	13 1900 SARC General Meeting	14	15	16 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: VECTOR 2m Contest (see page 12)
17	18	19 1930 SEPAR Net 2000 SARC Net SARC Basic Course	20	21	22	23 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: CQ WW DX (CW)
24 CONTEST: CQ WW DX (CW)	25	26 1930 SEPAR Net 2000 SARC Net SARC Basic Course Exam	27 1900 SARC Exec Meeting	28	29	30 08-1000 SARC Social: Kalmar Family Restaurant

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>

December 2019

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3 1930 SEPAR Net 2000 SARC Net	4	5	6	7 11am-2pm SARC Christmas luncheon, Guildford Golf & Country Club, 7929 - 152 nd St CONTEST: FT8 RoundUp
8 Delta ARS ComFest Swap 10am-1pm CONTEST: FT8 RoundUp	9	10 1930 SEPAR Net 2000 SARC Net	11	12	13	14 08-1000 SARC Social: Kalmar Family Restaurant 8076 King George Blvd, Surrey, BC
15	16	17 1930 SEPAR Net 2000 SARC Net	18	19	20	21 08-1000 SARC Social: Kalmar Family Restaurant
22 CONTESTS: ARRL Rookie RoundUp (CW)	23	24 1930 SEPAR Net 2000 SARC Net	25 26 MERRY CHRISTMAS 		27	28 08-1000 SARC Social: Kalmar Family Restaurant CONTEST: RAC Winter (CW, SSB)
29 CONTEST: RAC Winter (CW, SSB)	30	31 1930 SEPAR Net 2000 SARC Net NY Eve	HAPPY NEW YEAR			

Contest Details: <http://hornucopia.com/contestcal/contestcal.html>

The Telegraph Trail Through BC

A massive undertaking for its time

British Columbia's Telegraph Trail is a historic maintenance road along an old telegraph line. The history goes back to 1865, when the first telegraph line was built, followed later by the Yukon Telegraph Trail. This road has played an important role in the history of Canada's west and north.



Although the Telegraph Trail Preservation Society no longer exists (it was abolished in 2006) the organization did manage to restore and preserve a portion of this road for recreational use [see map left]. Near Blackwater River, the Telegraph Trail intersects with the Alexander Mackenzie Heritage Trail.

The Yukon Telegraph Trail was almost 3000 km in length and connected Dawson City to southern Canada. In 1936, the history of the Telegraph Trail came to its end. Nowadays, those who venture out on the

original route, now a wilderness trail, will find scarce remains of these times. With a little imagination, you can walk back in history. There are backcountry campsites at several locations along the trail.

The Trail's History

The Russian-American Telegraph, also known as the Western Union Telegraph Expedition and the Collins Overland Telegraph, was a \$3,000,000 (equivalent to \$49.1 million in

Trails: hiking trail follows a historic telegraph line northwest from Quesnel to Hazelton. The 100 km southern section of the trail between Quesnel and the Blackwater River forms a section of the National Trail.

This is a wilderness trail so the appropriate wilderness precautions are required.

Access fee: None

Nearest town: [Quesnel, BC](#)

Website: [Telegraph Trail | Hike Canada BC Section](#)

Points of interest: The trail follows the route of the Collin's Overland Telegraph line of 1865-66 which became the Yukon Telegraph in 1901.

Other activities:

Lodging: Quesnel has a few motels and other accommodations.

Camping: There are backcountry campsites at several locations along the trail

Interactive map: [Quesnel Region](#)

Tourism info: [Quesnel | North Cariboo](#)

Getting to the trails: The southern trailhead is 15 km west of Quesnel. There is a connector trail to Quesnel. There is access to the trail at the intersection of the Mackenzie Heritage trail near Blackwater River.

<http://www.canadatrails.ca/hiking/bc/telegraph.html>

present-day terms) undertaking by the Western Union Telegraph Company in 1865-1867, to lay an electric telegraph line from San Francisco, California to Moscow, Russia.

The route was intended to travel from California via Oregon, Washington Territory, the Colony of British Columbia and Russian America, under the Bering Sea and across Siberia to Moscow, where lines would communicate with the rest of Europe. It was proposed as an alternate to long, deep underwater cables in the Atlantic.

Abandoned in 1867, the Russian-American Telegraph was considered an economic failure, but history now deems it a "successful failure" because of the many benefits the exploration brought to the regions that were traversed. To date, no entities have attempted a communications cable across the Bering Sea, with all extant submarine communications cables that travel westbound from North America following more southerly routes across much longer stretches of the North Pacific Ocean, connecting to Asia in Japan and then on to the Asian mainland.

When that section of the line reached New Westminster, British Columbia in the spring of 1865, the first message it carried was of the April 15 assassination of Abraham Lincoln.

In May 1865 construction began from New Westminster to Yale and then along the Cariboo Road and the Fraser River to Quesnel. Winter brought a halt to construction, but resumed in the spring with 150 men working northwest from Quesnel.

In 1866, the work progressed rapidly in that section, fifteen log telegraph cabins had been built and line had been strung 400 mi (640 km) from Quesnel, reaching the Kispiox and

Bulkley Rivers. The company's sternwheeler, Mumford, traveled 110 mi (180 km) up the Skeena River from the Pacific Coast three times that season, successfully delivering 150 mi (240 km) of material for the telegraph line and 12,000 rations for its workers.

The line passed Fort Fraser and reached the Skeena River, creating the settlement of Hazelton when it was learned that Cyrus West Field had successfully laid the transatlantic cable on July 27.

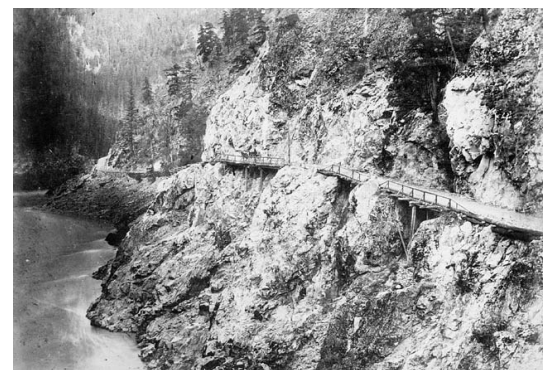
In British Columbia, construction of the overland line was halted on February 27, 1867, as the whole project was now deemed obsolete.

Nevertheless, left behind in British Columbia was a usable telegraph system from New Westminster to Quesnel, which later would be run to the Cariboo Gold Rush town of Barkerville, and a trail that had been beaten through what had largely been uncharted wilderness.

In addition, the expedition left behind a vast store of supplies that were put to good use by some of the First Nations inhabitants. Near Hazelton, Colonel Bulkley had been impressed by the bridge the Hagwilgets had built across the Bulkley River, but was reluctant to let his work party cross it until it had been reinforced with cable.

After the project was abandoned, the Hagwilgets at Hazelton built a second bridge from cable that the company had left behind. Both bridges were considered marvels of engineering and were credited as being "one of the romances of bridge building."

The Colony of British Columbia meanwhile could further explore, colonize and communicate with its northern landscapes beyond what had been done by the [Hudson's Bay Company](#).



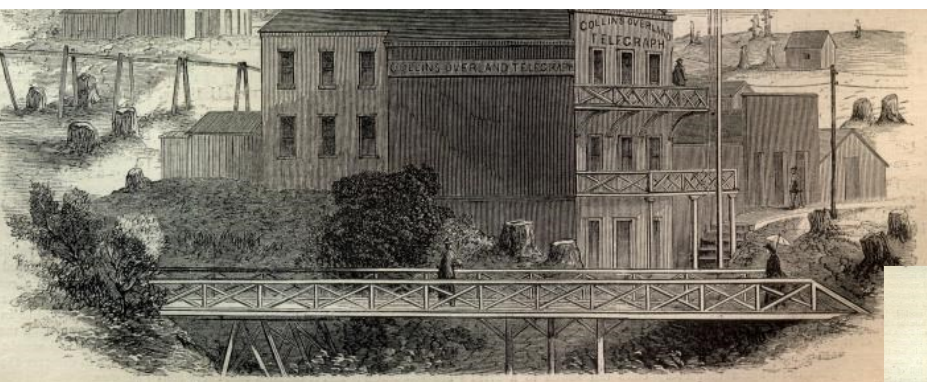
Telegraph Trail construction in the BC Cariboo

Many of the towns in Northwestern British Columbia can trace their initial European settlement back to the Collins Overland Telegraph. Some examples of these are Hazelton, [Burns Lake](#), [Telkwa](#) and [Telegraph Creek](#).

The expedition also laid a foundation for the construction of the [Yukon telegraph](#) line which was built from Hazelton to Telegraph Creek and beyond to Dawson City, Yukon in 1901.

Portions of the telegraph route became part of the Ashcroft trail used by gold seekers during the [Klondike gold rush](#). Of all the trails used by the stampeders the Ashcroft was among the harshest. Of the over fifteen hundred men and three thousand horses left [Ashcroft, British Columbia](#) in the spring of 1898, only six men and no horses reached the goldfields.

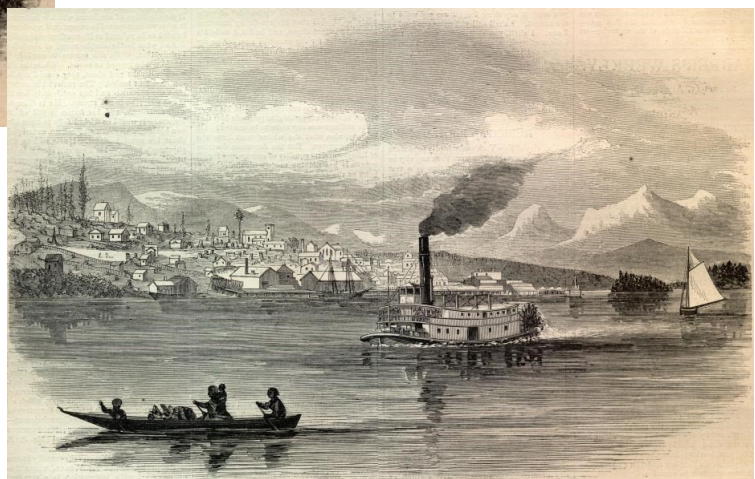
~



New Westminster, BC in 1865

Above: The Collins Overland Telegraph office.

Right: The view northeast from the Fraser River



BC place names associated to the Collins Overland Telegraph

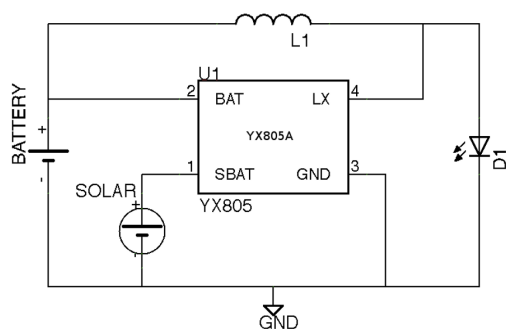
- The Bulkley River, [Bulkley Valley](#), Bulkley Mountains (now named the [Bulkley Ranges](#)) and the settlement of [Bulkley House](#) in British Columbia are named after Colonel Charles Bulkley. The name of the [Bulkley-Nechako Regional District](#), a regional government in that area, is derived from the geographic names.
- [Burns Lake](#) was named after Michael Byrnes, scout for the Collins Overland Telegraph scheme who explored the route from Fort Fraser to Skeena Forks (Hazelton, BC)
- [Decker Lake](#) was named after Stephen Decker, construction foreman in British Columbia.
- The [Telegraph Range](#) in the [Ootsa Lake](#) area is one of several landforms whose name is associated with the project

TECH TOPICS

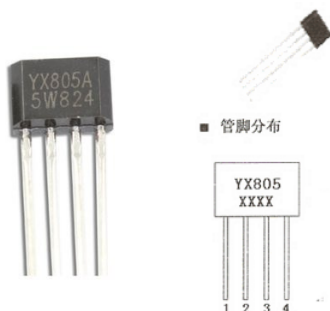
John Schouten VE7TI

Power From Expended Batteries

I was recently explaining to my grandkids how a solar garden light works. As you are no doubt aware, they're for sale inexpensively at the neighbourhood dollar store... is anything there still a dollar? Anyway, that led me to take one of these \$2 marvels apart to see what circuitry it contained. This is what I found:



Not including the cheap rechargeable battery there are only 4 components and one of those is the solar cell! The 'heart' of the circuit is a YX805, described in the datasheet as a 'solar LED driver IC'. They sell for about 7 cents a piece on eBay.

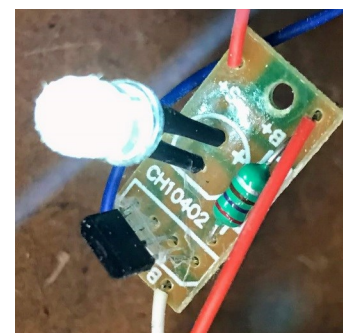


A garden light turns off its LED when the solar cell is charging the battery during daylight. At night the solar cell doesn't charge and the converter, sensing this, turns on the LED, so this is a solar battery charger and LED driver all in a TO-94 package. It rectifies the solar input as well as detects when it is dark in order to activate the LED.

Many "Joule Thief" circuits, including a much older LED solar light I have, depend on a bulky toroid or "donut" that has to be carefully wound with copper wire [see the second part of this article]. But there are now several very small 4 legged ICs available that do the job using only a simple inductor, single cell battery and a LED. In effect, the 4 legged IC replaces the clunky toroid.

Another component is a miniature inductor, which at first glance looks like a resistor, that the driver uses to boost the voltage from the battery high enough to light the LED. Remember your basics? When current flows the inductor sets up a magnetic field. When the current is removed that field collapses and send a voltage into the load. By varying the winding in the inductor we can determine the voltage produced.

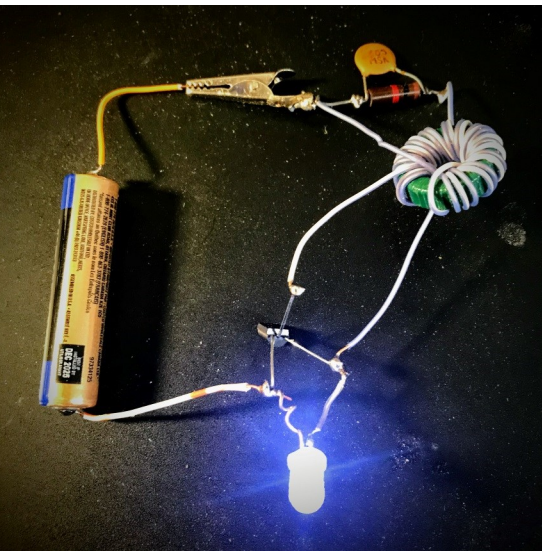
The driver uses the same mechanism as a boost regulator but without any of the filtering. The result is an LED that is imperceptibly flickering on and off and can stay on at very low voltages, less than a fully charged 1.3v AA cell. This is a simplified switched-mode power supply.



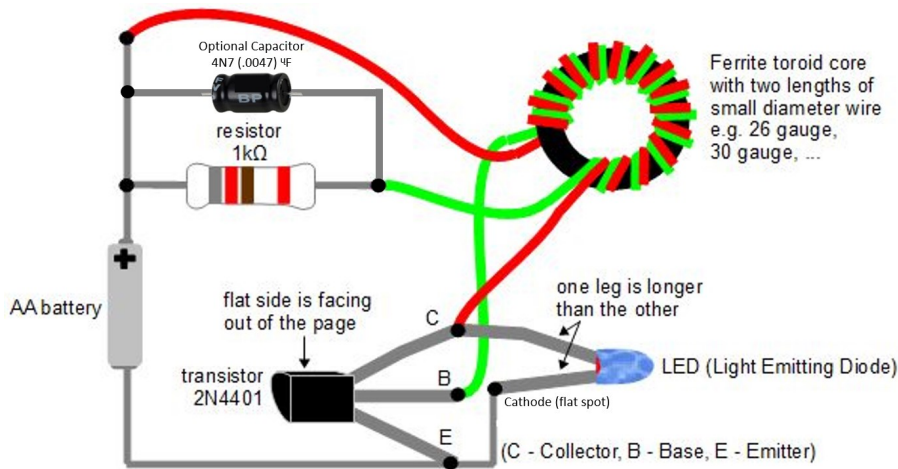
The circuit board inside the \$2 LED Solar Light. Only 3 components on the board

A Joule is the energy dissipated as heat, when an electric current of one ampere passes through a resistance of one ohm, for one second.

It's named after the English physicist James Prescott Joule (1818-1889)



The 'Joule Thief' mockup and circuit.
The AAA cel here is 1.0 volt.



The transistor used is a common one, a 2N4401, but could be a 2N3904, BC547B, 2SC2500, BC337, 2N2222, or another NPN. I had the 1 kΩ resistor and LED in my parts bin as well. The LED was salvaged from a faulty string of Christmas lights.

The circuit can utilize an input voltage down to about 0.35 volt and can run for weeks using a 1.5 volt AA

battery. If new, the starting battery voltage is usually 1.5 volts.

The photo [top left] shows the tacked together circuit. The AAA cel used measured exactly 1.0 volt, yet produced good illumination despite being powered by a mostly discharged battery.

You will note the addition of a .005 μ F capacitor. This will further improve the lifespan of the battery and is placed in parallel across the resistor.

The circuit works by rapidly switching the transistor. Initially, current begins to flow through the resistor, secondary winding, and base-emitter junction (see diagram) which causes the transistor to begin conducting collector current through the primary winding. Since the two windings are connected in opposing directions, this induces a voltage in the secondary winding which is positive (due to the winding polarity) which turns the transistor on with higher bias. This self-stroking positive feedback process almost instantly turns the transistor on as hard as possible, making the collector-emitter path look like essentially a closed switch. With the primary winding effectively across the battery, the current increases at a rate proportional to the supply voltage divided by the inductance.

The gain of a transistor is not linear with the Collector-Emitter voltage (VCE). At low supply voltages (typically 0.75 V and below) the transistor requires a larger base current to maintain saturation as the collector current increases. Hence, when it reaches a critical collector current, the base drive available becomes insufficient and the transistor starts to pinch off and the previously described positive feedback action occurs turning it hard off.

To summarize, once the current in the coils stops increasing for any reason, the transistor goes into the cut-off region (and opens the collector-emitter "switch"). The magnetic field collapses, inducing however much voltage is necessary to make the load conduct, or for the secondary-winding current to find some other path.

When the field is back to zero, the whole sequence repeats; with the battery ramping-up the primary-winding current until the transistor switches on.

If the load on the circuit is very small, the rate of rise and ultimate voltage at the collector is limited only by stray capacitances, and may rise to **more than 100 times the supply voltage**. For this reason, it is imperative that a load is always connected so that the transistor is not damaged. Because VCE is mirrored back to the secondary, failure of the transistor due to a small load will occur through the reverse Base-Emitter voltage (VBE) limit for the transistor being exceeded (this occurs at a much lower value than VCE max).

The transistor dissipates very little energy, even at high oscillating frequencies, because it spends most of its time in the fully on or fully off state, so either voltage over or current through the transistor is zero, thus minimizing the switching losses.

The switching frequency in the example circuit opposite is about 50 kHz. The LED will blink at this rate, but the persistence of the human eye means that the blinking will not be noticed.

I found that a commercial version of a flashlight, meant to use depleted AA cells, is marketed under the Joule Thief name.

This was an enjoyable little diversion from the usual playing with antennas. I haven't yet found a practical purpose for application of this circuit to Ham radio but it demonstrated the principle of induction very well. Besides, I had the parts, wiring is simple and it worked perfectly the first time. Instant satisfaction!

~ John VE7TI



Tower takedown by Art VE7WMM and John VA7XB at the residence of silent key Bill Kuzenko, VE7FZD.

SOLDER SPLATTER

The Non-Roll-up Roll-up J-Pole

John Schouten

VE7TI



In the [April 2019](#) [page 49] issue of *The Communicator* we presented the simple roll-up J-Pole antenna that our Basic class students build as a practical exercise. It is a gain antenna that tunes and works well, especially as a substitute for a handheld transceiver 'rubber duck'. I have personally used this antenna in my travels, in hotel rooms, our RV and camping. I also used it during our ownership of a stationary Park Model RV in a resort where antennas were not permitted. I managed to disguise the rollup J-Pole as a flagpole which kept everyone happy. So, as a follow-up to the earlier article, here is the non-rollup J-Pole that can be used as a permanent dual-band antenna.

I used a 5-foot length of common 0.75-inch white pipe typically used in lawn sprinkler systems plus an end cap to keep out water. A 10-foot length was less than C\$8, enough for 2 antennas. I bought a fancy adjustable [flagpole mount](#) from [Amazon.ca](#) for less than C\$7, although any other type of sufficient diameter would do. This antenna could also be mounted to an existing pipe or mast with U-bolts.

In the original roll-up J-Pole, above and on the side of the notch, the ladder line has no electrical purpose but adds rigidity. You can use shorter ladder line to make the antenna smaller and lighter and substitute this 'missing' ladder line element with a single wire approximately 32 inches long. The entire antenna is a couple of inches shorter than the original to compensate for being inside the tubing.

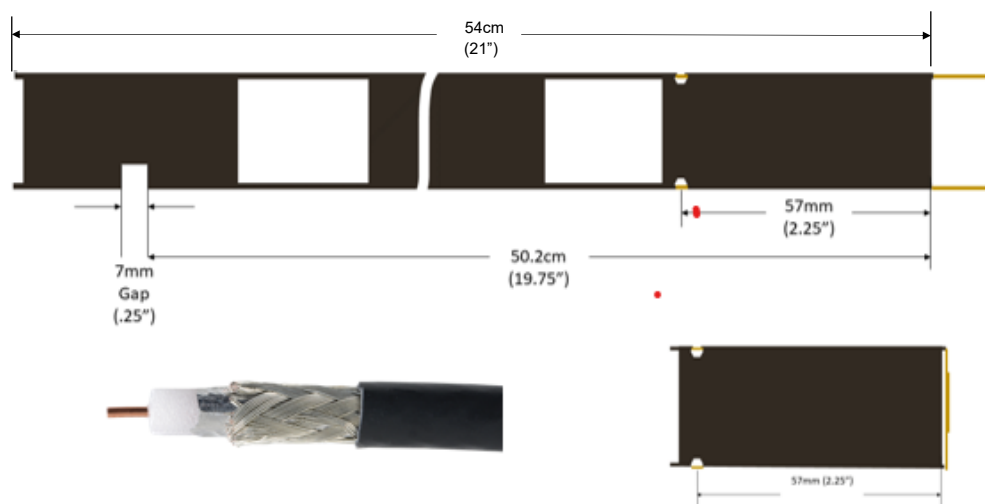
I used SARC's antenna analyzer to complete all my measurements and to fine-tune the design. It tunes perfectly on 2m and is usable on 70cm as well at slightly higher SWR.

Start by building the antenna:

- 22 inches of 450 ohm ladder line;
- A piece of hookup wire, 32 inches long. Bare copper, lamp cord or speaker wire seems to work equally well;
- A length of decent quality 50 ohm coax suitable to reach your operating position;
- A suitable connector to fit your transceiver; and
- Tape or heat shrink tubing and a zip tie.

The original roll-up J-Pole used ladder line for the entire 51.5 inch length to ensure rigidity. As the pipe now provides that, we can substitute plain wire for most of the radiating element, thereby reducing the cost.



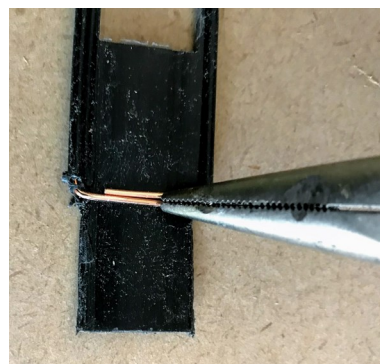


Start out with about 22 inches of 450 Ohm ladder line and at least 80 inches of RG-58 coax.



Strip sufficient insulation from your ladder line to fold both ends together.

Try to keep a plastic tab there

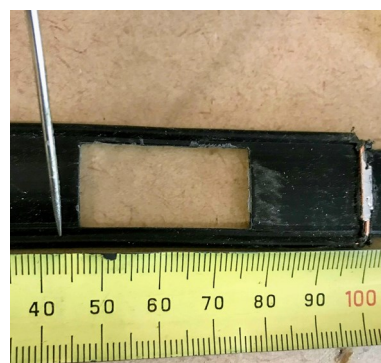


Bend the wires together at 90°, then clean both stripped wires so that there is no corrosion and they're nice and shiny.



Solder the ends together.

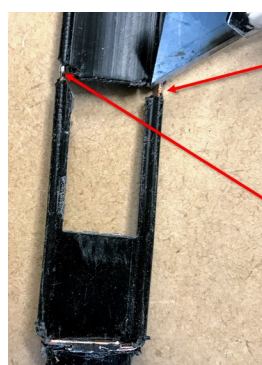
It should look something like this... nice, shiny and smooth



Measure up 57mm (2.25") from the bottom joint to mark the coax connections

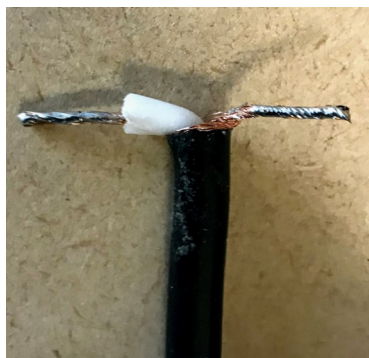


Remove the insulation at the 2 marks.



Clean the bare wires so they are nice and shiny.

Tin the joints with solder



Strip the coax end as shown

You want it to look like a sharp 'T'

Be careful of stray wires from the braid

Tin the joints with solder

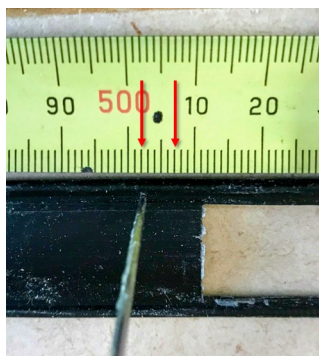


Solder your prepared coax, maintaining that 'T' shape

Careful not to melt the centre insulation



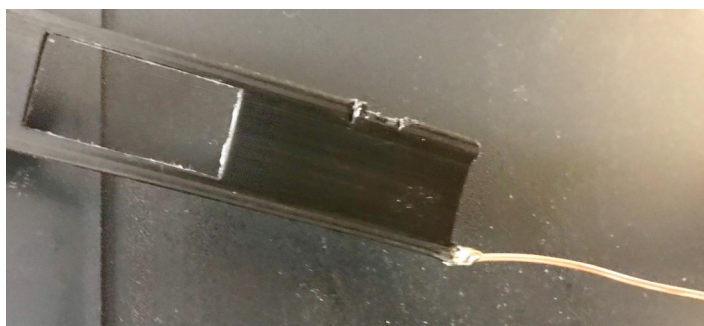
Add some tape for mechanical strength. It should look like this now.



On the braid side of the coax, mark the spots for the 7mm (.25") cut-out at 502 and 507mm (19.75 and 20") from the soldered end.



On the braid side of the coax, where you marked, remove 7mm (.25") of the wire



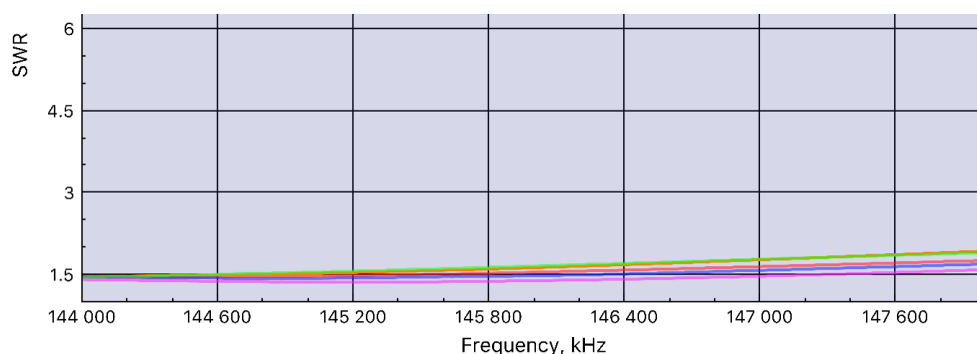
Solder the 81cm (32") piece of single wire to the radiating side of the ladder line.

NOTE: That is the side without the notch!

You're now ready to slip the antenna into the tube, but leave a bit of the single wire sticking out of the top for trimming. Ensure the single wire stays straight—use some tape inside the tube, if necessary.



Ensure that you thread the coax through the pipe before attaching your connector, or if your connector is already attached, feed the coax through the pipe from a hole about 12cm (5 inches) from the bottom end, to leave sufficient clearance for the mount.



Trim the single wire at the tip of the tube for best SWR, replacing the cap between measurements. Above right is the SWR plot for the 2m band (144–148 MHz) at around 1:1.5 which is good for this type of antenna. SWR at 70cm is slightly higher but well within the acceptable range. The trace colours represent the angle of the flagpole mast, with the best result straight up in the air, and the highest SWR at horizontal orientation. You will enjoy this antenna.

~ John VE7TI

The Ham Stick Dipole

Low Cost—Good Results

John Schouten

VE7TI



Years ago, while actively RV'ing, I spent considerable time investigating the most successful antenna for portable operations. I started with a simple wire launched into a tree. Suspicious looks from campground staff and issues with tuning soon caused me to abandon the method. Reading up on the options, I happened upon an article on HamSticks.

If you are not familiar, these are straight two-piece antennas that may be mounted vertically or horizontally. They are available for almost any band and cost about C\$30–\$40 each. Each HamStick is comprised of the connector, typically standard 3/8 x 24 thread, a fiberglass rod about 48 inches long on which is wound a coil covered in plastic, and a 'stinger', a metal whip adjusted to resonance using a setscrew.



I found better performance with a single HamStick than the wire in the tree, but it was not as sensitive as I had hoped. Further research led me to a HamStick dipole mount, shown top left. This permitted me to mount two HamSticks, tuned to the same band, as a dipole antenna, horizontally or vertically. It clamped easily onto a section of mast and was rotatable by the 'Armstrong' method to gain directivity.

Did it work? Yes, it did. I immediately noticed reduced noise and a difference in the number of stations I was able to work. Raising the antenna to a greater height, using an extendable painter's pole, improved the signal even more. A recommendation to add 5 turns of coax below the antenna had no noticeable effect.

I ended up purchasing a set for 6, 10, 20, 40 and 80m, the only drawback being lowering the antenna to change bands. My greatest success was on the higher bands. 40 and 80m worked, 40 was better and 80 less so, but I was still having better success than anything else I had tried and I made contacts throughout North and South America, Asia, and Australia on my iCom IC-7000 at about 70 Watts. Europe was always elusive for me.

There are several commercial, and expensive versions of this system. [Buddipole](#), starting at US\$199.00, is probably the most well known. I have used a borrowed one and it works no better or worse than my much less expensive HamSticks.

My Hamsticks are still in occasional use, though the RV is gone. Most recently, Robert VA7FMR was having issues working HF from his apartment. He had purchased several commercial antennas and discovered that more expensive does not equal greater success. He borrowed my HamSticks as a trial and his review is included in the column on the next page. He went one better and installed twist-on connectors to make the process of changing bands easier and faster.

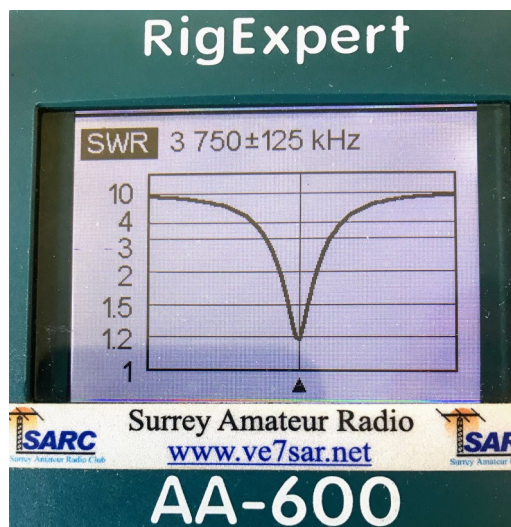
Much later, when we spent winters in an antenna restricted RV Resort in Palm Springs, I bought a [Hi-Q 5/80](#) screwdriver antenna [[see the story on our blog](#)]. It performs somewhat better than the HamStick dipole without the need to change whips for bands, and with sharper resonance, which is both a blessing and a negative as it works extremely well when tuned precisely whereas the HamSticks have a greater bandwidth with less tuning.

Is this the best antenna you can buy? Probably not, but it is good value for the money, especially if you are restricted from using a bigger antenna. My one recommendation though is to use a good quality antenna analyzer to properly tune each HamStick for the area of the band you intend to work because, as with all antennas, proper tuning is everything.

~ John VE7TI



Top: Adjusting the 'stinger' whip to length using the setscrews. Mark the resonant point on the whip for future ease of assembly! Below left: It takes a bit of effort to cut the stainless steel whip. Filing a groove then snapping with lineman's pliers seems to work best. Below centre: Great SWR on 80m in the phone band with a sharp Q. Top right: Mounting the two HamSticks on the offset mount. One is at ground—the coax shield, the other to the coax centre conductor. Right centre and bottom: The dipole HamSticks in operation.



A good look at my antenna failures... And successes

There is a good video
on HamStick dipole
use on YouTube at:

<https://www.youtube.com/watch?v=w5YdTarpDHU>

And in the field:

<https://youtu.be/CbQwLPVmG70>



A quick disconnect option

When I look back at my time as a newbie in this wonderful hobby of ours, I am surprised that I have lasted for four years. I was fortunate that I passed my test with Honours, so I was able to look at contesting right away, since I was qualified to work HF. My ventures into the world of contesting were few, and those few were not very successful at first because I live in an apartment, which restricts my use of long wire antennas.

After reading much praise for it's successes, my first expensive mistake was the purchase of a loop antenna, which filled my patio deck with its huge size but did little about raising a sizeable number of signals on my radio. My next sally into the world of antennas was a screwdriver. This was a great antenna when installed as it should have been, at my niece's house, when I provided it with the ground plane that I could not provide on my patio. When I was baby sitting my niece's home and dogs, whilst the family was away on vacation, I found two antennas which allowed me to perform reasonably well on several contests, even winning one in my category. Both antennas were of course, long wire antennas. One was a 75 foot end fed long wire with a nine to one un-un at the feed point and the other was a short 65 foot Windom antenna with the appropriate choke feed to prevent RF in "The Shack". I was also able to install a very decent ground wire, which is well hidden in my niece's back garden. So, as you can see, I had a major problem at my apartment which I did not seem to be able to resolve.

At the Club Saturday morning coffee break at the Kalmar restaurant in Surrey, I poured out my woes to all that would listen. John Schouten VE7TI listened to my problems and asked me if I would like to borrow an antenna which he used when camping. Having told me of its size and footprint, it seemed like a reasonable thing to give a try. It was a center fed dipole antenna, using two truck type adjustable whip antennas. The fibreglass bottom part, about a four foot length, was wound with the appropriate length of wire for the band worked. The wire whip was also about four feet long and was also used to tune the antenna. One antenna was attached to the mount as the resonator and the other was grounded to the mount as the second leg of the dipole.

The item borrowed was on the 20 metre band and fit my patio perfectly. When I finally turned on my radio I was astounded to hear stations from thousands of kilometers away. But not only that, I could talk to them as well as hear them. What a great thrill.

I did some research and found that the whip antennas come tuned for 80-40-20-15 and 10m. I purchased two 5 packs and an aluminum mount. I also purchased ten of the spring loaded quick release twist off attachments *[see photo left]* which allow me to change bands in seconds. All of my antennas have been tuned, and when I remove them they do not go out of tune so are ready to be reused the next time I change bands. The total length of the dipole is about 16 feet and only the whip wire extends from the far edge of my patio. I have not had one complaint from my landlord or neighbours. The Pacific Islands, Japan, Scotland, Northern Europe and Italy have been my playground and I am more than happy with my centre fed dipole.

Give it a try, and I am sure you will be as impressed as I and work the world from your patio dipole.

73,

~ Robert Fishwick VA7FMR

You are cordially invited to attend the
SARC Christmas Luncheon

Place: Guildford Golf & Country Club, 7929 - 152nd Street, Surrey.

Date: Saturday 7th December. **Time:** 11 am to 2 pm

Menu: Roast turkey with all the fixings, choice of salads, Apple Crisp & custard, tea & coffee. (Vegetarian, contact Jinty). Liquor available for purchase.

Entertainment will be part of the event.

Invitation is extended to the Langley & White Rock Clubs & SEPAR

Cost: \$25 per person.

Payment options: PayPal (select "donation" and write "Christmas event"), or cheque/cash at the October & November SARC Meeting.

RSVP to: jinty.reid@gmail.com



Tech Topics

John Brodie

Installing A Mobile Transceiver

VA7XB

Neighbourhood Emergency Preparedness (NEPP)

Part 1 - Why Amateur Radio?

I have recently become involved in the Neighbourhood Emergency Preparedness Program (NEPP) for Panorama Ridge in Surrey, a relatively large area comprised of over 1000 homes extending about 4 km from east to west and 1.5 km from north to south. There is considerable topographical relief in this area of Surrey, most of which is on the edge of a plateau with steep slopes adjoining low elevation farmland on the foreshore of Semiahmoo Bay. This geography makes it challenging for conventional VHF/UHF radio communication which relies on “line-of-sight” and is blocked by humps and hollows in the landscape.

Our NEPP group has been wrestling with development of an emergency plan including a means of communicating during a disaster which, in the worst case, may involve failure of commercial power, telephone and Internet and, in the case of an earthquake, may be accompanied by physical disruptions to foot and vehicle traffic. Especially during the early phases following such an event, neighbours should be able to communicate with each other to provide self-help, and also have the means of alerting external response agencies of fire, rescue and other emergency needs.

After much discussion and review of options, the plan sets out that residents and organizers should ideally be able to

deploy more than one method of communication. At a basic level, neighbours may have to interact using vehicles, bicycles, or even on foot. At a secondary level they should have available GMRS/FRS radios (aka “walkie-talkies”) to communicate locally, acknowledging the limitations of these devices which have been found to reliably work only over a short range (500 m or less).

A third and more reliable means of communication is amateur radio, having the advantages of greater power, range and accessibility to a pre-existing network of certified operators providing local communicators throughout the area. Many amateur radio operators have their own handheld radios or mobile radios using battery power. Further, hams in Surrey (and elsewhere) can access radio repeaters provided with assured power (battery and UPS) which can link with other area repeaters and the Internet and thus facilitate world-wide communication through IRLP and Echolink.

Amateur radio operators who are serious about emergency preparedness practice their skills regularly through traffic nets and formal training provided by both Surrey Amateur Radio Communications (SARC) and Surrey Emergency Program Amateur Radio (SEPAR).

The single disadvantage of amateur radio is that its users are required by regulation to be government-certified. This implies a commitment of time and effort and a modest level of technical skill to pass the exam. For some, this

Amateur radio operators who are serious about emergency preparedness practice their skills regularly through traffic nets and formal training

represents a substantial hurdle, however our experience is that most 12-year olds are capable of passing the exam. As its contribution to NEPP (and virtually anyone else who has the interest), SARC is offering a twice-yearly 8 week course on amateur radio leading to certification of new operators, with the next course commencing on October 8th.

Persons who become certified as amateur radio operators should, in the interest of preparing for an emergency, elect to install a VHF/UHF radio in their vehicle or home or, at a minimum, have available at all times a fully-charged hand-held radio with spare batteries. Those who are most fully committed will have all three, and regularly practice using them.

Part 2 - The Challenge of Installing a VHF Radio in a Modern Vehicle

The foregoing was by way of an introduction to my own personal challenge.

When I sold my old car 3 years ago, I had to remove the VHF/UHF radio which I had installed earlier. I procrastinated relocating it to the new vehicle because of many obstacles which I didn't feel motivated to overcome. For example, there was no longer a logical place to attach an antenna and I was not about to drill holes in areas, now made of plastic, which had formerly been metal. Also, I could not identify any easy way to pass cables through the firewall between the interior and the engine department. Furthermore, no location in the car seemed appropriate for placement of the control head or the radio itself, without drilling holes or taking up needed space.

While preaching to the NEPP group about the benefits of amateur radio it became obvious that I would have to put action to my words, so over the summer I renewed a determination to get a radio installed in the new car. It turned out to be challenging, but do-able, so here I relate my experience in the hope it will motivate others to do the same. My "new" vehicle is a 2014 Ford Explorer.

The job was made more complicated because I wished to install 2 radios: an IC-2820 for voice communication and also a modified Tait radio containing a "Tiny Tracker" using packet for APRS tracking. That meant 2 antennas, one for each radio as I wished to avoid antenna switching. The 2820 has a control head which can be located remotely from the radio.

Antenna. The simple NMO bracket attachment which worked for my previous car was no longer suitable for the new one as the hood and rear hatch have rounded edges with no hidden place to fasten sheet metal screws. The solution was two Comet RS-720NMO universal lip mounts that attach to the hood in the only suitable locations, i.e. close to the driver and passenger sides. This mount can be adjusted in all 3 planes so that the antenna becomes vertical when the hood is closed. The NMO fitting is suitable for my two Larsen or Comet mobile antennas.

Power. I purchased two 40 amp circuit breakers to attach to the battery. From there the cabling is #10 gauge red-black zip cable all the way to the Anderson Power pole splitter at the radio location. Some of



One of two Comet RS-720 NMO lip mounts & dual band antennas (one for each radio)

Below: The currently recommended method of battery connection using positive lead to battery and other unused lead to ground near the battery.



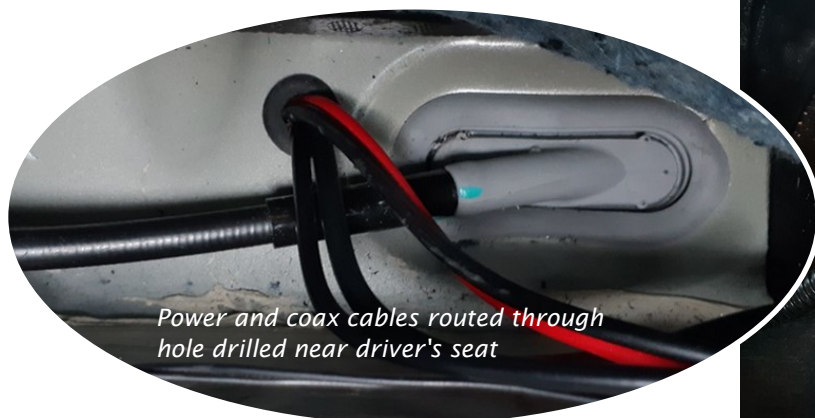
the references I consulted on installing power cabling for mobile radios suggest fusing both the positive and negative leads joined directly to the battery however I have since learned that this is not recommended. After being enlightened by John VE7TI about other views on this subject¹, I was convinced that it is better, and safer, to have only one fused connection to the positive terminal of the battery and ground the other wire near the battery, without fusing or connecting to the battery.

In the process of correcting what was now deemed to be an improper power connection, I opened the hood only to find this! A mouse had nested on top of the battery; this was the second time the mice have found my engine a desirable place to spend the winter and I believe it occurred in the Interior during recent camping trips.



Mouse nest on top of the battery discovered during correction of connection to the battery.

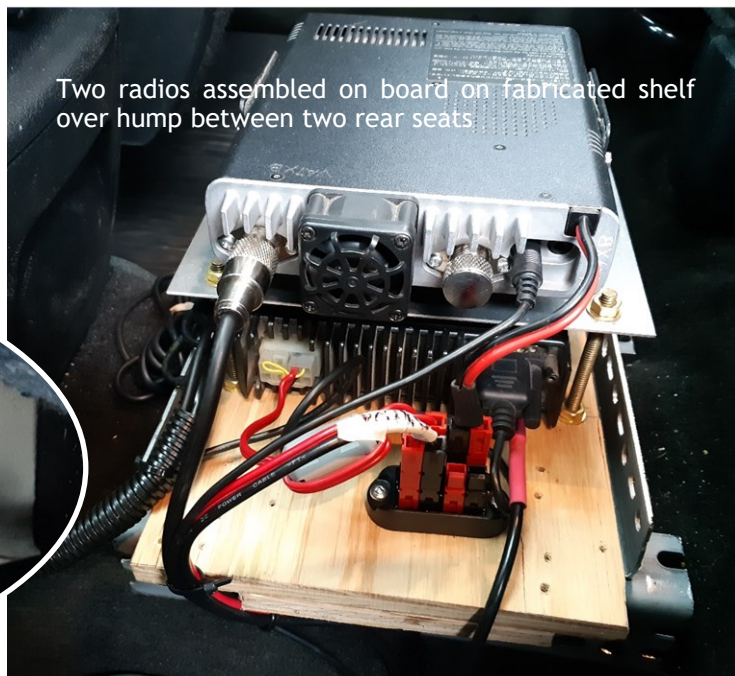
Cabling. This turned out to be the most challenging part. It was necessary to pass 3 cables from the interior of the vehicle to the engine compartment (two coax cables and a common power cable). I did not want to drill holes through the firewall, because



Power and coax cables routed through hole drilled near driver's seat

it is impossible to determine what is on the other side. With minor effort, I was able to remove plastic molding along the driver's side, lift the carpet and protective insulation to reveal a single layer of sheet metal on the bottom of the car near the driver's seat. I drilled a 5/8" diameter hole in the metal and installed a rubber grommet allowing the cables to be passed safely through. All cables beneath the car were protected by a length of 3/4" split loom from the grommet to where the power and two coax cables emerged in the engine compartment near the battery. The other, larger cable shown in this figure is the manual brake cable.

Radio Placement. The most common location to install the radio is beneath the front seat, however this did not work for me as the space was insufficient for two radios. My vehicle must occasionally accommodate 2 adults, 4 grandkids, a dog and luggage in the back, all at the same time. Given these demands, the only suitable place I could identify for the radios was the drive shaft hump on the floor midway between the rear seats. Since the hump has a rounded top, it necessitated fabricating a flat platform from perforated angle stock to accommodate the curvature. The 2 radios were stacked on this platform as shown on the photo. Power, coax, GPS, speaker and control head wiring connected to the radios was hidden underneath floor mats and routed where needed to the remainder of the car.



Two radios assembled on board on fabricated shelf over hump between two rear seats

Control Head. This proved to be another challenge as I did not want to deface the dashboard with holes or block any of the display. The photo shows where the control head was finally located after several unsatisfactory attempts. It required fabrication of a bent aluminum bracket that fits snugly into a recess above a storage compartment between the front seats. Cabling was secured with clamps to minimize flexing which might break the wires of the RJ-11 connector. The mic was hung from the air vent with a paper-type clamp bent to suit.



Remote speaker. This was placed in an inconspicuous location above the dashboard and held in place with Velcro. Connecting wires were concealed by pushing under the plastic moulding.

GPS sensor. This has a magnetic base and sits on top of the dashboard, also affixed with Velcro.

Protective cover. An appropriately sized plastic storage container sits loosely over the radio assembly to serve as a dust cover and protect against accidental movement of wires and connectors.

Conclusion. Some of these ideas may be applicable to others wishing to install a radio in their vehicle. Most likely, innovation and customizing will be necessary as every vehicle has unique features that require different approaches. The older the car, generally the easier it will be.

~ John VA7XB

Upper left: Remote control head for IC-2820 installed in dash.

Lower left: Custom panel pulled out to show how control head is installed in recess in dashboard .



Upper right: Remote speaker and GPS sensor fasten to top of dash with Velcro

Lower right: Inverted storage container over radios for protection

¹ Connecting to the grounded negative post of a battery with a device that has a ground path is an equipment hazard and a fire hazard with or without the negative fuse. This is because if the fuse opens, the main power through the device will still be returned through whatever cables or wires are attached that are grounded, like an antenna shield.— see the next article for a detailed explanation.

Fusing The Negative Lead Or Not?

Charles T. Rauch Jr.

Proper mobile radio wiring explained

W8JI



The only battery post negative connection should be to or from another battery negative, the vehicle chassis, and/or the engine block. There should never be a direct negative post path to accessory equipment.

There is a serious flaw with the suggestion mobile radios be wired across battery terminals. The negative radio lead should actually not have a fuse, and not be wired to the battery post.

History of Vehicle Accessory Equipment Grounds

Early vehicles had both positive and negative grounds. USA passenger vehicles evolved, standardizing on "12 volt" negative ground systems. The resting voltage was around 12.6 volts, with ideal running voltage in the low 14 volt range. Many large commercial vehicles, however, retained positive grounds. Non-standardization of systems meant two-way radios and other add on equipment was generally designed to operate with either negative or positive grounds. This was accomplished by floating the internal negative supply buss, while grounding all normally accessible external user ports to the case or cabinet.

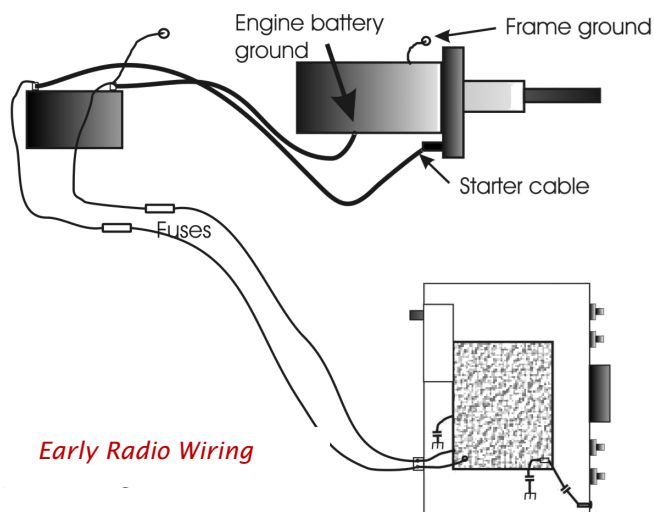
These early systems started the trend of negative fuses, with both power leads directly

attached to the battery. This was not harmful, because the equipment had a completely isolated internal "ground " that was electrically isolated from all other leads leaving the device.

Once any other lead common with the negative bus leaves the case, it is no longer safe to conned the negative to the battery post. It is also not safe to fuse the negative lead.

Early Radios Any Polarity Ground

In most early CB and commercial two-way radios, the negative buss inside the unit fully floated from the cabinet and any external ports. This included commercial two-way radios like the Motorola Motrac, Micor, and other expensive, high-quality, radios. The floating negative was universal across brands including, but not limited to, GE and RCA land mobile equipment.



The floating negative allowed use of radios in either negative or positive ground vehicles. It also solved ground loop issues, allowing direct connection to battery posts without fire or equipment damage hazards.

Equipment manufacturers had no way of knowing if the final installation would be in a negative ground vehicle or a positive ground vehicle. As a result, systems with a floating negative buss were shipped with both negative and positive power line fuses. The floating negative buss system inside the radio allowed safe direct connection to the battery posts, and safe shutdown if either the positive or negative fuse opened.

The floating negative power buss made it impossible for starter or charging currents to flow through antenna cables, microphone, or speaker leads. All exiting connections, as well as the case, were electrically isolated from the negative lead.

Negative Ground Only Equipment and Radios

Over time, vehicles with positive grounds disappeared. As this happened, manufacturers stopped using the more-expensive and more-complicated floating negative power bus system.

Many vehicle manufacturers, and most aftermarket equipment manufacturers, never rethought the systems others were using. Manufacturers carried over the acceptable negative fuse idea appearing in ground independent power buss systems, which could also use a negative battery post connection. Manufacturers misapplied the allowable fused

negative battery post connection to equipment with internally grounded negative bus systems.

Not realizing the safety hazard, they continued to fuse both negative and positive radio power leads and often advised direct battery post negative connections. The battery post connection actually created ground loop, fire, and equipment safety hazards.

This terrible idea has permeated the aftermarket accessory market, including amateur radio, audio, and performance or race car electronics markets. For example, MSD Ignition's installation instructions advise a direct battery post negative connection, putting the vehicle's distributor, the MSD box, and other electronics at risk.

Although absolutely incorrect, a popular assumption is fusing the negative lead can protect internal and external equipment wiring, including gauge, computer, speaker, microphone, key leads, and antenna connections from open battery ground connection damage.

The only battery post negative connection should be to or from another battery negative, the vehicle chassis, and/or the engine block. There should never be a direct negative post path to accessory equipment.

Normal vehicle wiring is shown and discussed in detail on this page link.

Improper mobile radio grounding

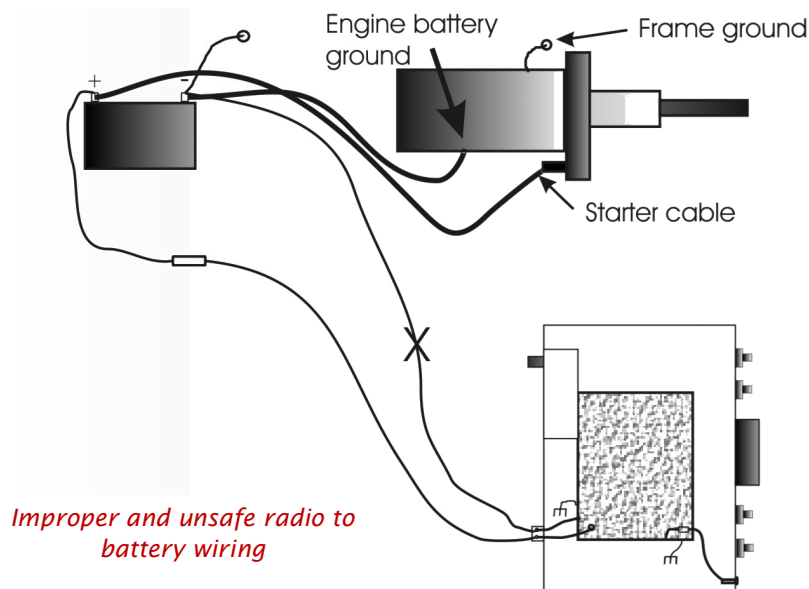
Follow the current in this system (*diagram next page*)...

If the ground or negative wire from the radio to the battery opens, radio current would flow from the radio out through the antenna cable, the speaker jack, the key jack, or any other jack or connector that connects to the radio circuit board grounds to the vehicle chassis.

If the battery to engine block ground opens, or the engine block and battery to chassis grounds open, the battery will ground back through the negative radio connection to the radio, through



Charles currently has a four-square for 160 using 120/240 degree phase shift (more gain, better pattern) with four 1/4 wl vertical elements. He also has a 220 foot insulated tower, a 300-foot insulated Rohn 55G tower, a 315-foot Rohn 65G, a rotating 200-foot tower with monoband Yagis for 40 through two meters.



circuit boards or other connections, and to the vehicle chassis.

While a radio negative lead fuse will protect higher current circuits, it will not protect small traces or components like those connected to insulated jacks or connectors.

For example, when my radio system lost a negative fuse connection, foil traces for the keyer paddle grounds inside my

ICOM 751A burned open. I could no longer send CW.

The traces opened even though the negative lead was fused, because the radio's transmitter current of ~20 amperes flowed through small circuit board traces to my CW key. The CW key was grounded by touching a metal bracket, and this melted foil traces on a circuit board inside the radio. With a grounded negative buss and battery post connection:

Anytime the battery negative to chassis ground opens, vehicle accessory and lighting currents, or a portion of vehicle accessory and lighting load current, will flow through the radio

Anytime the negative fuse opens, the radio will ground itself through the coax or other external connections

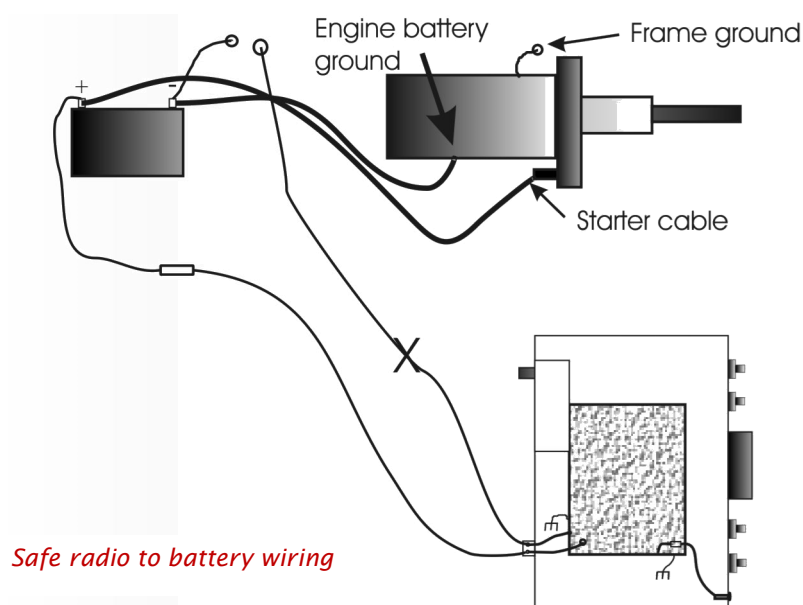
This also sets the radio up for increased alternator whine, since load currents can superimpose themselves on traces and connections inside the radio.

Connecting the radio or accessory equipment's grounded negative supply does nothing good. Grounding to the battery negative post generally increases alternator whine. It also places the vehicle's computer and electrical system at higher risk, is unsafe for the radio or accessory, and is unsafe for things connected to the radio.

I've had vehicles with higher power radios that have opened a negative fuse, and then melted the coaxial cable shield on RG58/U cables. This is because, once the fuse connection was lost, the equipment grounded itself to the vehicle chassis through the grounded antenna cables.

A Safe Mobile Radio Ground

(Diagram lower left) It is pretty simple to improve the grounding system. If we ground the radio negative lead to a separate but good chassis ground near



the battery ground, ground loops through the vehicle's computer system, through the radio, and through anything connected to the radio or accessory, are completely avoided.

Ideally, this ground should not share the bolt that grounds the battery to chassis ground cable. The negative power ground should be on its own bolt. The fasteners should be good hardware, with proper star washers. The ground must provide solid, reliable, mechanical and electrical connections.

If the radio or accessory device's chassis power ground lead opens, only radio or accessory current will flow through the radio circuit boards. While this may still open a trace, it is much less likely to happen because we have eliminated a needless weak point, the negative fuse, and we have eliminated the direct connection to the battery where battery acid slowly eats away at connections.

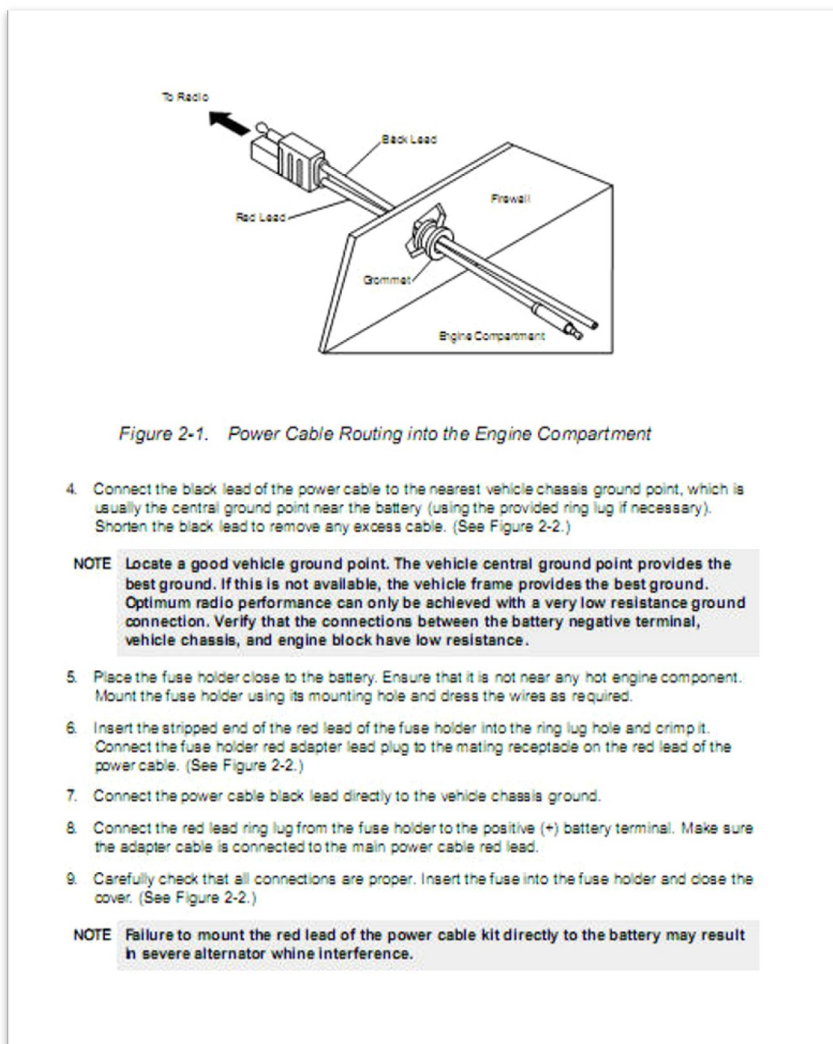
A vehicle chassis power ground completely eliminates the current path through the radio or accessory if the engine block ground battery lead opens, and alternator AC ripple no longer can drive the negative lead to the radio. Any connection can fail, and in the very worse case possible we have only radio operating current. In most cases, we will not even have that.

It also helps to have multiple ground points as additional insurance against the negative power lead accidentally floating.

Never ground to battery!

http://www.w8ji.com/mobile_ground.htm

~ Charles W8JI

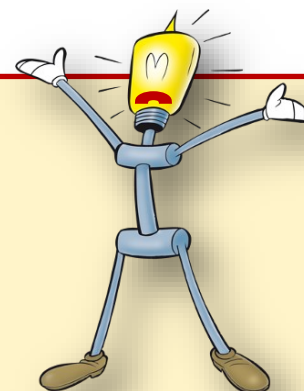


Above: Motorola warns to not use a negative fuse or battery negative post connection, but rather directly connect the negative lead to the vehicle chassis.

- Only the positive lead is fused.
- Only the positive lead goes to the battery post.

Last Notice: Membership Fees Are Now Past Due

You will be removed from our membership roster this month if you have not yet renewed. Payment may be made at any monthly meeting, at the Saturday coffee meeting, by mail or via PayPal. Details on payment options are available at our website at: <http://ve7sar.net/join.html>



Making Your Own QSL Cards

John Schouten

Microsoft Publisher Does The Job For Me

VE7TI

A QSL card is a written confirmation of either a two-way radiocommunication between two amateur radio stations or a one-way reception of a signal from an AM radio, FM radio, television or shortwave broadcasting station. It can also confirm the reception of a two-way radiocommunication by a third party listener. A typical QSL card is the same size and made from the same material as a typical postcard, and most are sent through the mail as such.

QSL card derived its name from the Q code "QSL". A Q code message can stand for a statement or a question (when the code is followed by a question mark). In this case, 'QSL?' (note the question mark) means "Do you confirm receipt of my transmission?" while 'QSL' (without a question mark) means "I confirm receipt of your transmission."

Amateur radio operators exchange QSL cards to confirm two-way radio contact between stations. Each card contains details about one or more contacts, the station and its operator. At a minimum, this includes the call sign of both stations participating in the contact, the time and date when it occurred (usually specified in UTC), the radio frequency or band used, the mode of transmission used, and a signal report. The International Amateur Radio Union and its

member societies recommend a maximum size of 3½ by 5½ inches (140 mm by 90 mm).

As the editor of this publication I get my share of computer time and I think that I have developed quite a bit of proficiency with various text editing and graphics programs. I have been asked on several occasions for the best method of producing good looking QSL cards.

There are a number of avenues available. Some involve sending your details to a site, often in Eastern Europe and selecting a design that appeals to you. Most allow you to use a photo that you submit, some restrict you to a catalog of standard Amateur Radio related images. Local printing shops will do QSL cards as well but at a substantial price depending on whether the design in single or multi-coloured, quality of images, one or two sided, etc.

Exchanging QSL cards is not as common as it once was, mostly the result of rising postal rates and the accessibility of electronic means of exchange like eQSL. Despite this, I still enjoy receiving a card for unique and special event stations and I receive several requests for my QSL card annually.





SARC
Surrey Amateur Radio Club

Surrey Amateur Radio Communications had its beginning in the Electronics Lab of the North Surrey Senior Secondary School in the spring of 1975. Today it is one of the most vibrant and active Amateur Radio groups on the West Coast of North America with over 100 members. We are active in almost all facets of the hobby and provide support to the City of Surrey for community and emergency preparedness communications. Our newsletter 'The Communicator' is read worldwide.

- tinyurl.com/SARC-Video
- ve7sar.blogspot.ca
- ve7sar.net
- facebook.com/SurreyAmateurRadio
- twitter.com/ve7sar

QSO with	YYMMDD	UTC	MHz	Digi Mode	RS(T)
☐ PSE QSL ☐ TNX QSL		Thanks for the QSO · 73		mail@ve7sar.net	

I resolved several years ago to have the flexibility to create not only a standard VE7TI QSL card but also the ability to make up cards on the fly for special events, contest and Field day efforts. Having experimented with photographic cards (one-sided and reasonably expensive), I finally settled on my desktop publishing program Microsoft Publisher for this task.

Publisher is a component of a suite of Microsoft Office programs that form part of Office 365. This is a subscription based service that costs about \$100 per year but which assures you of frequent upgrades and always having the 'latest and greatest' on your computer. I had used earlier versions of Office including Office 2007, Office 2010 and Office 2016 but they lack features that folks come to expect in a modern newsletter, such as Internet links, more fonts, and advanced graphics tools.

So what makes up an attractive QSL card. If you ask that of a typical Ham you will likely get a number of answers. Generally though it should feature a clear photograph, typical of the shack, an event or a landmark in the Ham's operating area. A well-drawn cartoon can also be attractive. It is obvious that racy images or off-colour material should not be used as they may be regarded as offensive. Any text should ideally not obstruct the image and be simple enough to read clearly. Contact details should be included on either the front or rear of the card and a brief description of the station should also be included.

Format

The top graphic [left] shows the Microsoft Publisher screen. The card face and reverse are shown on their sides as it prints 4 to a page. To fit, the card has to be sideways. Publisher works much like Microsoft Word. You can add images, text etc. and position them on the page.

The reverse has our SARC logo, a description of SARC and the entry fields for contact details.

Printing

To print a 'one-of' card at home, I use thick photo paper and an inkjet printer. My preferred method though is to export to a PDF file and take it to my local Staples store. They have high quality colour laser printers that my home printer cannot match. I also have a much broader selection of paper there and my preferred choice is a card stock with a smooth finish. The price seems to vary from job to job but it is often less than a dollar a page which works out to C\$0.25 per card. If you're fortunate and they're not busy they will usually trim them as well, otherwise I'm forced to use my home paper cutter.

Special Events

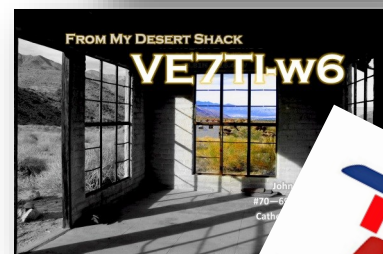
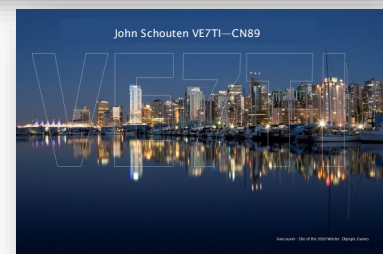
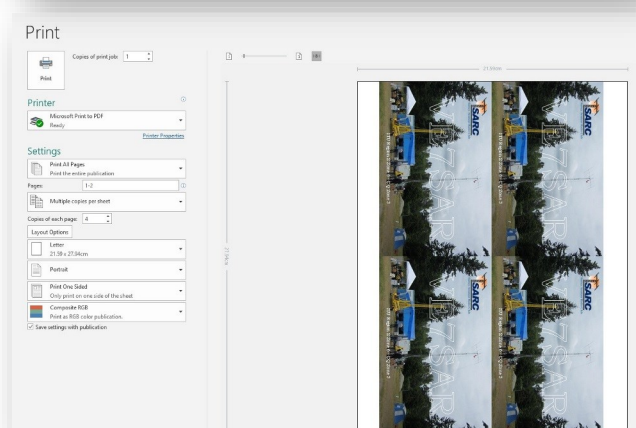
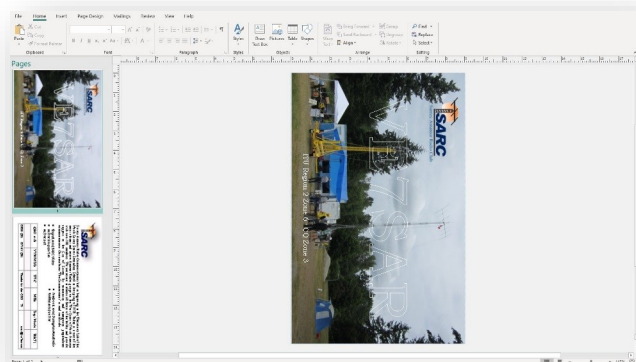
It is inexpensive enough that I can run off a set of cards for contacts made during a special event, such as a contest or when using a special event callsign.

My template is on-line at <https://tinyurl.com/QSL-4up> should you wish to give it a try.

Here are two other 'Do-It-Yourself' QSL card online options.

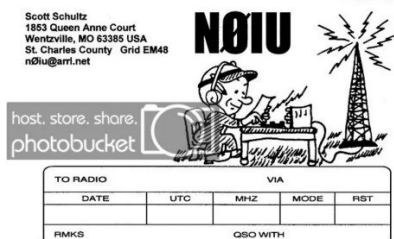
MS Word template https://www.qsl.net/n9bt/qsl_template.htm

On-line PDF Card Creator: <http://www.radioqth.net/qslcards/>



A New QSL Card For KW1L

Dan Romanchik,
KB6NU



A couple of weeks ago, my friend Paul, KW1L, sent me a scan of the QSL card below, and asked, “Any advice on how I can make the same QSL card as the attached file with my calls and address?”

Paul had tried contacting N0IU to see where he’d gotten the QSL card, but found out that, unfortunately, Scott had recently passed away. Knowing that I created my own QSL card designs, he asked for my help.

Now, this design is really simple, but without the artwork used to create it, coming up with a new design would be a bit more difficult. I can manipulate images, but I’m not very good at creating original artwork.

Another interesting complication is that the image of the operator is rip-off of a cartoon created by Phil Gildersleeve, W1CJD, or simply “Gil,” whose illustrations graced the pages of QST for more than 40 years. It was a good try, but lacks the character of the original Gil drawing. Since I wanted to use the original, rather than this rip-off, I asked Paul to inquire as to whether the image was still copyrighted and if he could use it. Paul did inquire and did get permission to use it.

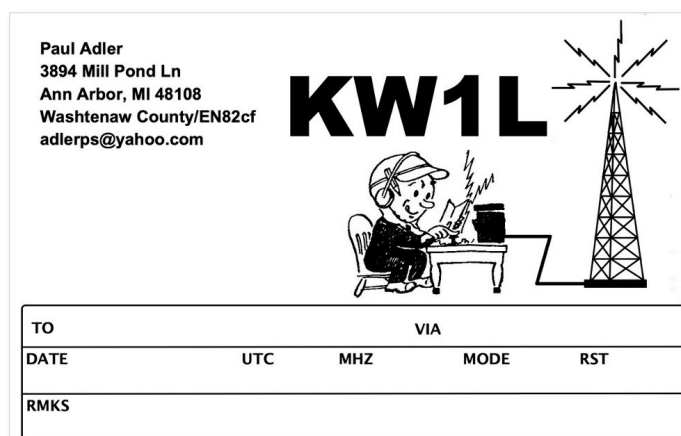
Next, Paul found a CD of ham radio clip art with this image on the disk. He brought it over and I got to work. The first think I noticed is that the Gil cartoon only includes half the table. So, I did a little copying and pasting and was able to create the

other half of the table as seen on the N0IU QSL card.

The next thing I did was to paste the image of the tower from the N0IU card onto the new KW1L card. I didn’t like that very much, though. The image of the tower is even more crudely drawn than the image of the operator. So, I made my own tower. As simple as they may seem, the radio waves emanating from the tower proved to be the hardest part. First, I had to get the shape just right. Then, I had to copy them, rotate them, make the background invisible, and then fit the rotated images onto the tower image. The final QSL card is shown below.

Although I’m not a great artist, I think that the tower (and the entire card) looks pretty good. Let me know what you think. If you’d like the TIFF file, let me know, and I’ll send it to you. (It’s a little more than 5 Mbytes).

~ Dan KB6NU



KB6NU's Column

Dan Romanchik, KB6NU

FT8 really is reshaping amateur radio



FT8 really is reshaping amateur radio. Even if all DXpeditions swore not to use FT8 bots (but you know they will), hams are moving to FT8 and related modes in huge numbers. Here are a couple of related items that I ran across yesterday.

The Summer 2019 edition of the Northern California DX Foundation newsletter included the following:

Why use FT8 mode in DXpeditions?

FT8 is rapidly becoming the digital mode of choice for DXpeditions and here are some reasons why:

- Important for little pistol stations, especially in antenna-challenged HOA or high-noise neighborhoods.
- No other mode has the capability of working five different calls in parallel in the same sub-band with queuing.
- Very high rates possible compared to RTTY, which equals more ATNOs in the log.
- Easier to reach certain parts of the world under poor propagation conditions and weak solar cycles.
- Excellent mode for challenging bands like 6M and 160M.

- Still get credit for a digital QSO toward awards, etc.
- May attract new operators or revitalize older ones.
- Excellent mode for hearing or speech-impaired hams.
- DQRM not a problem.
- Less stressful for DXpedition operators.
- Has tremendous remote operation possibilities.
- Along the same lines, the ARRL has decided to reactive the Band Planning Committee. A news article yesterday notes:

In an effort to more effectively address HF digital technology issues, ARRL President Rick Roderick, K5UR, has reactivated the ARRL Board of Directors' HF Band Planning Committee. The six-member panel, chaired by First Vice President Greg Widin, K0GW, will primarily focus on spectrum allocation issues that have gained increased visibility with discussions on accommodating automatically controlled digital stations (ACDS) — many employing Winlink email. The



When he's not trying to figure out which way current flows, Dan blogs about amateur radio at KB6NU.com, teaches ham radio classes, and operates CW on the HF bands. Look for him on 30m, 40m, and 80m. You can email him at cwgeek@kb6nu.com.

committee will also discuss operating frequencies for FT4, FT8, and other digital modes. Widin says the committee will meet next week to chart its course. Reactivation of the HF Band Planning Committee came out of discussions during the July 2019 ARRL Board meeting.

I really am of two minds on this. As my friend Jeff, KE9V, said on Twitter, “FT8 is an amazing software application that allows your personal computer to experience all the thrills and excitement of global two-way radio communications!” Note that he didn’t say that it allows you to experience the thrill, but rather your computer. He decries the impersonal nature of FT8, and I have to say that I kind of agree with him on this.

On the other hand, to paraphrase an NBA cliché, the band don’t lie. The CW segments, and even the SSB segments, of the HF bands are often quiet or relatively inactive, while the FT8 segment is chock full of signals. I may not find the impersonal digital modes all that exciting myself, but you can’t argue that they’re not popular and possibly deserve a little more bandwidth.

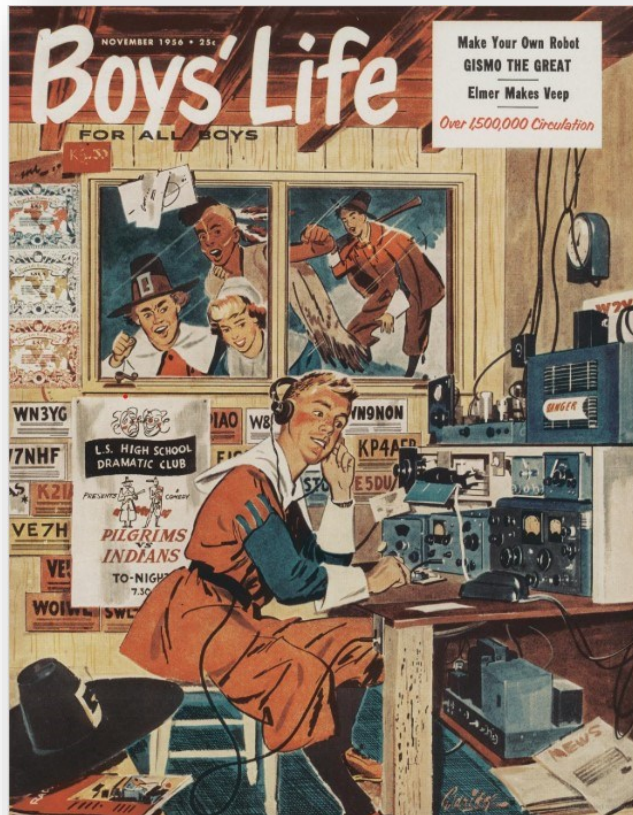
Take a look at these related posts:

- [K1JT lets the FT4 cat out of the bag](#)
- [No Nonsense Amateur Radio Podcast #12: JS8CALL passes messages with...](#)
- [No Nonsense Amateur Radio Podcast #6: FT8 is exploding!](#)

~ Dan KB6NU

Memories Of Yesteryear

Boy's Life Magazine



Around the World in a Dugout Canoe:

The Untold Story of Captain John Voss and the Tilikum

by John M. MacFarlane
VE7AXU, Lynn J. Salmon

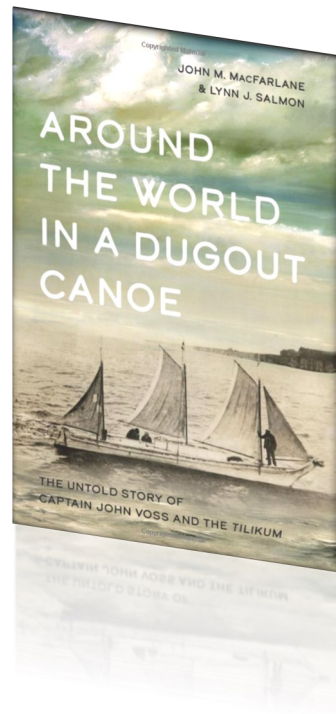


Anticipating fame and wealth, Captain John Voss set out from Victoria, BC, in 1901, seeking to claim the world record for the smallest vessel ever to circumnavigate the globe. For the journey, he procured an authentic dugout cedar canoe from an Indigenous village on the east coast of Vancouver Island.

For three years Voss and the Tilikum, aided by a rotating cast of characters, visited Australia, New Zealand, South Africa, Brazil and finally England, weathering heavy gales at sea and attracting large crowds of spectators on shore. The austere on-board conditions and simple navigational equipment Voss used throughout the voyage are a testimony to his skill and to the solid construction of the Nuu-Chah-Nulth vessel.

Both Voss and his original mate, newspaperman N.K. Luxton, later wrote about their journey in accounts compromised by poor memories, brazen egos and outright lies. Stories of murder, cannibalism and high-seas terror have been repeated elsewhere without any regard to the truth. Now, over a century later, a full and fair account of the voyage—and the magnitude of Voss's accomplishment—is at last fully detailed.

In this groundbreaking work, marine historians John MacFarlane and Lynn Salmon sift fact from fiction, critically examining the claims of Voss's and Luxton's manuscripts against research from libraries, archives, museums and primary sources around the world. Including unpublished photographs, letters and ephemera from the voyage, *Around the World in a Dugout Canoe* tells the real story of a little-understood character and his cedar canoe. It is an enduring story of courage, adventure, sheer luck and at times tragedy.



Ham Gear

Contact John VA7XB
604-591-1825
va7xb@rac.ca

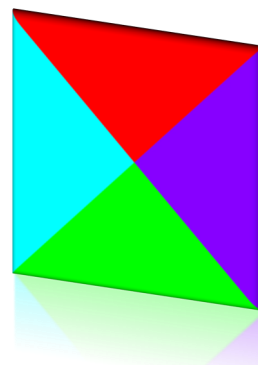
- Astron RS-35M power supply - 35 amp \$150
- Comet B-10 NMO mobile antenna (only 12" high) for 2m/440 \$20
- MFJ 269 antenna analyzer + dip meter attachments \$150



Foundations Of Amateur Radio

Onno Benschop VK6FLAB

When you hear a distress call ...



Podcast: Foundations of Amateur Radio - Episode 200

When you get your amateur radio license you become part of a select group of humans who are required to notify authorities if you happen to hear an emergency transmission. Not only that, you're required to offer assistance.

The regulator in Australia, the ACMA, says this about it:

When a distress call is heard, you must immediately cease all transmissions. You must continue to listen on frequency. You must record full details of the distress message, in writing and if possible recorded by tape recorder.

You must also wait for a short time to see if the message is heard by a station better placed to help.

If the distress message is not acknowledged within a reasonable time, the amateur is obliged to assist.

The regulator goes on to say that after acknowledging or attempting to acknowledge receipt of the distress message, you should immediately forward details of the distress situation to the nearest police station for land based distress situations or the Australian Maritime Safety Authority for air or sea based distress situations.

In the United States, the ARRL uses the word may, rather than must, but essentially says the same thing. The FCC,

the US regulator, says that an amateur station is not restricted by any rules to attract attention in the case of distress, nor is there any restriction on assisting a station in distress. In the UK, the regulator specifies that instead of waiting for a reasonable time you must wait for three minutes for a Coast Station to reply before responding.

Interestingly, getting information on how to respond, what you must and must not do is hard to come by. This in itself is a cause for concern, but let's move on.

Using the Australian example and requirements, how prepared are you to do this? Could you actually record the information, do you have a pen and paper next to your radio and can at short notice dig up a tape-recorder, or presumably some more modern recording device, capable of recording audio from your station?

Do you have the contact details for search and rescue at hand and are you actually prepared for such activities?

During the week, an amateur in Australia reported that they heard a distress signal five hours after the event. While they were at work, their station recorded off-air and they listened to the recording after returning home.



*For the audio
podcast
Foundations of
Amateur Radio
visit the website:
<http://podcasts.itmaze.com.au/>*



Using social media, they asked the question, should they report this information to authorities?

The answer is Yes, not only should they, in this case, given that they're in Australia, they must. There was no evidence that any other station heard the distress signal, in fact, the evidence was that the other stations continued to transmit on frequency, either completely deaf, or engaged in more pressing activities like hunting for a contact.

I will note that propagation is a fickle beast and it's possible, though improbable, that the other stations on frequency didn't hear the distress call, even through it was repeated. For that reason alone, you should never assume that someone else will deal with it and as I said, in Australia, you don't get the option, you are required to.

A couple of other things came to light for that amateur this week. Their recording was in a format that was hard to process by normal audio processing software, in this case the recording was made as an I/Q recording, we should look at that some other time, but processing the file was non-trivial and valuable time was lost in uploading a huge file, and for others to download it for confirmation. There was also indecision about reporting the call to authorities and if so, to which ones.

I will say that while we don't know the outcome of the distress signal, we do know that it was reported and that at this point is exactly what is required.

The chances that you'll hear a real distress signal in your life are tiny, but if it happens, are you ready for it? I know I have some work to do.

I'm Onno VK6FLAB



All the power in the world and not enough battery!

Podcast: Foundations of Amateur Radio - Episode 195

The transceiver you use to get on air and make noise needs power to operate. The traditional voltage for our amateur equipment is 13.8 Volts. Why not 12 Volts you ask. The short answer is chemistry, but let's move on, there is lots to cover.

Generally that 13.8 Volt is specified with a +/- symbol and some percentage. For my radio it's 15%, which means that if I plug it into power that's somewhere between 11.7 Volt and 15.9 Volt, I'm good to go.

Then when you look a little closer at the specification you'll see that my radio draws 22 Amp. That's a whole chunk of juice that needs to come from a power supply. Of course that means that you'll also need to deal with 22 Amp fuses, wire capable of dealing with 13.8 Volt at 22 Amp, and connectors that won't melt when you do that.

If you look closer again, you might notice that 22 Amp is if you're using the radio at maximum power, that is, 100% duty cycle and 100% power, and only during transmit, in the case of my radio, 100 Watts for HF.

So, if I'm using a digital mode, AM or FM, at 100 Watts on HF, my radio says it will draw 22 Amp at 13.8 Volts.

Those numbers aren't correct if you're using CW or SSB. A rough number to work with for CW is 40%, that means if you're doing CW for a minute, that's the equivalent of key down at a 100% for 40 seconds and key up at 0% for 20 seconds.

SSB is roughly 4 times as efficient as AM, about 25% duty cycle, but realistically it's more like 20%, since your power consumption depends on how much you're yelling into the microphone. If you take long breaths, 0% power, whistle into the microphone, 100% of SSB, or 25% of overall power.

To listen to the podcast, visit the website:

<http://podcasts.itmaze.com.au/>

foundations/ and scroll to the bottom for the latest episode. You can also use your podcast tool of choice and search for my callsign, VK6FLAB.

All podcast transcripts are collated and edited in an annual volume which you can find by searching for my callsign on your local Amazon store, or visit my author page: <http://amazon.com/author/owh>.

Foundations of Amateur Radio Volume 7 is out now - with chapters on digital modes, coax connector loss, waterfalls, station performance and more.

Feel free to get in touch directly via email: onno@itmaze.com.au, or follow on twitter: @vk6flab (<http://twitter.com/vk6flab/>)

If you'd like to join a weekly net for new and returning amateurs, check out the details at <http://ftroop.vk6.net>, the net runs every week on Saturday, from 00:00 to 01:00 UTC on Echolink, IRLP, AllStar Link and 2m FM via various repeaters.

ITmaze -ABN: 56 178 057 063

phone: 04 1219 8888
onno@itmaze.com.au

Now all this gets even more interesting if you consider that you're not just transmitting all the time. If you're only transmitting half the time, you need to take your power consumption down another 50%, so SSB might be 10%, CW only 20% and the digital modes 50%, from the perspective of the power supply.

So you want to go portable and need batteries. Batteries don't come in 13.8 Volt versions. So 12 Volts. Get the number of amp hour and you're good to go right?

Nope.

Your battery doesn't just run at 12 Volts and then all of a sudden stop, it runs down, you've seen it in a torch or a Walkman when the tape got slower and slower. A 26 Ah battery should give you 26 Amp for an hour at 12 Volts, but if you actually do that, you'll need to buy a new battery, because you'll have destroyed the one you just exhausted.

All of this then starts a conversation about chargers, which incidentally might put out 14.4 Volts. You might turn to solar panels, which at peak power operate at something like 18 Volts, then you stumble into the world of PWM vs MPPT solar converters or charges. Then there's the joys of over and under current, battery discharge rates, continuous versus intermittent charging, different battery types, battery safety, storage, weight, out-gassing and more fun than you'll want to know about on your morning commute.

And I haven't even talked about battery isolation, HF interference from chargers and inverters, the differences between powering your radio straight from a battery or via a DC to DC converter, using 240 Volts, or if you're in the USA 120 Volts in the field, generators, compatibility with others and how much all this might cost and if you need to invest in lotto tickets to pay for this experience.

One tool I stumbled across in my travels is the Four State QRP Group website which has the W1PNS / WA0ITP / AB8XA Battery Life Estimator, which in a single web page gives you the ability to say what mode you'll be using, for how long with what battery size and how much radio draw and it'll tell you how much more battery you'll need to get the job done. Very handy for a contest that you're hoping to operate portable from a battery.

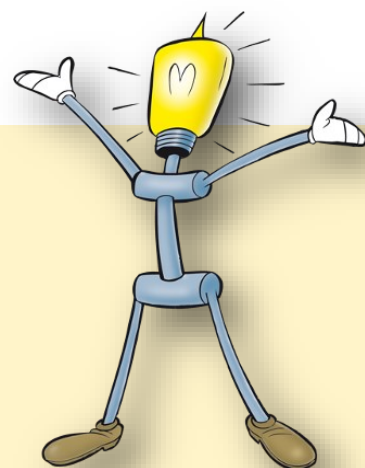
This all to say that power is a very deep rabbit hole and it will take you some time to figure out where your use pattern puts your requirements and budget.

Here be dragons.

~ I'm Onno VK6FLAB

Looks Like a Chinese translation of Kevin VE7ZD's June article...

The Chinese language technology website 599mag.com translated and included Kevin's article "A tale of two hams" featured in the June 2019 Communicator. Interesting to see our content get around, though it would have been nice if they had asked. You can access it [HERE](#).





No-Ham Recipes

Margaret Heaslip VE3EQE

Pecan Fingers



Margaret comments: "I use the very dark brown sugar for the top as it gives a better flavour. You can also use a few drops of rum flavouring in the base. This recipe freezes well."

BASE

- 1 cup (250 ml) soft butter
- 1 cup (250 ml) brown sugar
- 1 egg, beaten
- 1/2 teaspoon (2.5 ml) vanilla
- 2 cups (500 ml) flour

TOPPING

- 1 egg, beaten
- 1 cup (250 ml) brown sugar
- 1 cup (250 ml) pecans

Preheat oven to 350F (180C or a very moderate oven). For the base, cream the butter and sugar. Add egg, vanilla and flour and mix well. Spread on 9 x 13 inch (23 x 33 cm) pan.

Beat the egg and spread it over the base. Sprinkle half of the brown sugar over the egg, then sprinkle the pecans over the brown sugar. Finally, sprinkle the remaining brown sugar over the nuts.

Bake until golden. Cool, and then cut into bars or fingers.

~ Margaret VE3EQE



*I ordered a chicken and an egg from Amazon...
I'll let you know.*

Chicken or Egg?



Back to Basics

John Schouten VE7TI

From The Canadian Basic Question Bank

Fuses or Circuit Breakers?



This month a closer look at protecting your mobile transceiver.

B-003-017-010 Why are fuses needed as close as possible to the vehicle battery when wiring a transceiver directly to the battery?

The following are possible answers:

- A. To prevent an overcurrent situation from starting a fire;
- B. To prevent interference to the vehicle's electronic systems;
- C. To reduce the voltage drop in the radio's DC supply;
- D. To protect the radio from transient voltages.

A fuse is an electrical safety device that operates to provide overcurrent protection of an electrical circuit. Its essential component is a metal wire or strip that melts when too much current flows through it, thereby interrupting the current. It is a sacrificial device; once a fuse has operated it is an open circuit, and it must be replaced or rewired, depending on type. Alternatively, circuit breakers are automatically operated electrical switches designed to protect an electrical circuit from damage caused by excess current from an overload or short circuit. Its basic function is to interrupt current flow after a fault is detected. Unlike a fuse, which operates once and then must be replaced, a circuit breaker can be reset (either manually or automatically) to resume normal operation.

Circuit breakers are made in varying sizes, from small devices that protect low-current circuits or individual household appliance, up to large switchgear designed to protect high voltage circuits feeding an entire city. The generic function of a circuit breaker, or a fuse, as an automatic means of removing power from a faulty system is often abbreviated as **OCPD** (Over Current Protection Device).

Fuses have been used as essential safety devices from the early days of electrical engineering. Today there are thousands of different fuse and circuit breaker designs which have specific current and voltage ratings, breaking capacity and response times, depending on the application. The time and current operating characteristics of fuses are chosen to provide adequate protection without needless interruption. Wiring regulations usually define a maximum fuse current rating for particular circuits. Short circuits, overloading, mismatched loads, or device failure are the prime reasons for fuse operation.

A fuse is an automatic means of removing power from a faulty system; often abbreviated to ADS (Automatic Disconnection of Supply). Circuit breakers can be used as an alternative to fuses, but have significantly different characteristics.

An overcurrent is any current which exceeds the ampere rating of wiring, equipment or devices under conditions of use. The term "overcurrent" includes both overloads and short circuits.

Overloads

An overload is an overcurrent which is confined to normal current paths. An overload occurs when the current exceeds the value for which the wires or equipment are rated. This can happen when too many devices are connected to the circuit, or when a device connected to the circuit malfunctions in a way that causes it to draw higher than normal current, usually in the range of one to six times normal current. Sustained overloads eventually overheat circuit components. Therefore, fuses must open circuits experiencing sustained overloads before damage occurs. To be most effective, and to protect all components and wiring in the circuit, they must be installed as close to the voltage source as possible.

Short Circuits

A short circuit is current out of its normal path. It occurs when accident or malfunction creates an unintended path for the electricity to flow from the battery or alternator to ground. This shorter, more direct path to ground bypasses the resistance normally offered by the wiring and devices connected to the circuit. With virtually no resistance left to impede current flow, the voltage forces higher and higher current to flow through the wires to the point of the short.

Under such a condition, the current will quickly build to such a high level that the heat generated can cause insulation to burn and equipment to be damaged unless the circuit is opened through the use of an OCPD.

OCPD Selection Parameters

Since overcurrent protection is crucial to reliable electrical system operation and safety, OCPD selection and application should be carefully considered. When selecting fuses or circuit breakers, the following parameters should be evaluated:

Voltage Rating

The voltage rating, as marked on an OCPD, indicates the maximum voltage of the circuit for which the device is designed to operate safely in the event of an overcurrent. Therefore, the OCPD's voltage rating must equal or exceed the available circuit voltage where the device will be installed. System voltage exceeding the OCPD's rated voltage may result in fuse damage.

The speed at which a fuse blows depends on how much current flows through it and the material of which the fuse is made. The operating time is not a fixed interval, but decreases as the current increases. Fuses have different characteristics of operating time compared to current. A standard fuse may require twice its rated current to open in one second, a fast-blow fuse may

require twice its rated current to blow in 0.1 seconds, and a slow-blow fuse may require twice its rated current for tens of seconds to blow.

Once a fault is detected, the circuit breaker contacts must open to interrupt the circuit; this is commonly done using mechanically stored energy contained within the breaker, such as a spring or compressed air to separate the contacts. Circuit breakers may also use the higher current caused by the fault to separate the contacts, such as thermal expansion or a magnetic field. Small circuit breakers typically have a manual control lever to switch off the load or reset a tripped breaker.

Fuses have the advantages of often being less costly and simpler than a circuit breaker for similar ratings. The blown fuse must be replaced with a new device which is less convenient than simply resetting a breaker and therefore likely to discourage people from ignoring faults. On the other hand, replacing a fuse without isolating the circuit first can be risky in itself, particularly if the fault is a short circuit.

An OCPD device rating should be as recommended by your equipment manufacturer. In the absence of such a recommendation, the OCPD should be rated at no more than 20% above the expected voltage and typical maximum current draw.

So, getting back to our original question... **Why are fuses needed as close as possible to the vehicle battery when wiring a transceiver directly to the battery?**

A. To prevent an overcurrent situation from starting a fire.

You will find a detailed explanation on installing a mobile transceiver and proper wiring elsewhere in this issue of The Communicator.

~ John VE7TI



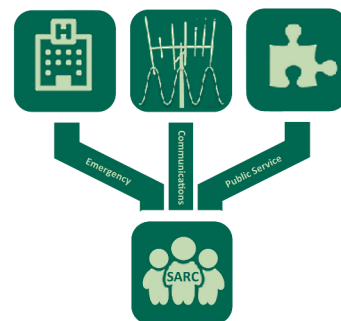
Above, a typical fuse holder and blade fuse;

Below, a circuit breaker suitable for mobile use.



Public Service

Amateur Radio Serving The City Of Surrey



Public Service Report

Don Hamilton VA7GL

We've been discussing the SARC Public Service Response to Natural disasters. I'd like to switch gears to discuss the challenges facing the ham community with the low solar cycles.

As we have found out with limited antennas and low power HF communication is difficult. What's available? The challenge is we traditionally require a significant change in hardware to communicate digitally. Now we have software to the rescue

UHF-VHF is only effective for line of sight, with good (high gain) antennas. Let face it, a handheld and a rubber ducky just won't do the job to move large amount of data quickly and reliability.

Several new below the noise level communication system have been developed. These are needed because regrettably the best communication method (Morse code) is difficult to master. Fldigi, and the new FT8 are becoming the front-line system for digital communications. They are now being adapted for the Public service/emergency communications. The latest innovation is called JS8Call, many public service/emergency communications groups are starting the experiment with these new tools.

JS8Call is an experiment in combining the robustness of FT8 (a weak-signal mode by K1JT) with a messaging and network protocol layer

for weak signal communication. The open source software is designed for connecting amateur radio operators who are operating under weak signal conditions and offers both real-time keyboard-to-keyboard messaging, store-and-forward messaging, and automatic station announcements. It may be used on HF or VHF.

Here is an example from the Palm Springs Club. They are evaluating JS8 Call to see if will become their messaging mode of choice for emergencies, because many of their members are already setup for FT8, using the same hardware. John VE7TI has forwarded me an excerpt from their newsletter:

"Earl KJ6DQR, with the help of Dale WA6MZW and Steven KM6HWX put together a presentation on FT8 CALL, a variation of the now ubiquitous JT8 HF digital program. The program lends itself to passing message forms like the ICS Hospital 213."

The following is the official Purpose statement of HICS 213:

The HICS 213 - General Message Form is used to record incoming messages that cannot reliably be transmitted orally to the intended recipients. Example long scientific or drug names. The HICS 213 is also used to transmit messages (resource order, status information,

other coordination issues, etc.). This form is used to send any message or notification to incident personnel that require hard-copy delivery.

Some thoughts on how best to start experimenting with the new mode. My thoughts would be to start with a small group of Hams that are already using FT8, Fldigi and/or FT4. Then we should ask for the volunteers to download the program and start to familiarize themselves with JS8Call. Next we could consider teaming up with one of our sister organizations to start to pass some traffic using one of the formatted message systems.

Would you please email me if you would like to experiment with JS8. The only requirement is that you need a radio that will have a CAT or TNC interface. My email is va7gl@icloud.com

~ Don VA7GL

SARC Public Service Committee Chair



SEPAR Report

Gord Kirk VA7GK



Surrey Emergency Program Amateur Radio

The purpose of SEPAR is to provide Emergency Communications for the City of Surrey during an emergency or disaster. As we move into the fall it is a change of seasons that often bring inclement weather and storms. We have experienced wind storms in recent years which have left many areas of the city and the Lower Mainland without power and at times communications. As individuals tasked with providing emergency communications it is important we ourselves are prepared. At our September SEPAR meeting we discussed our upcoming events and then we took a look at a home blackout kit. We discussed various options to have power to run our radios and light to see in our homes. From portable battery packs to power inverters as well as tips and tricks each of us have used to be prepared.

We began September participating in the Panorama Ridge Days event along with the Neighbourhood Emergency Preparedness Program (NEPP). This is another area of the Surrey Emergency Program which helps neighbourhoods be better prepared. They are looking to expand to neighbourhoods throughout Surrey helping neighbours prepare to help neighbours. One of the areas this program will cover is the need for communications. Amateur radio is the best option for communications when day to day communications fail. We will work closely with NEPP in this regard.

Earlier this year Surrey Fire offered training on Rapid Damage Assessment for our members. This will allow trained individuals to identify damaged buildings after an earthquake, flood, storm, etc. For a portion of our fall training we will continue training with some of the other Amateur programs which exist, and will provide the ability for our SEPAR members to provide accurate reports related to weather or other damage etc. which might be visible in their neighbourhood.

SEPAR meets the fourth Thursday of the each month. All are welcome to attend.

Upcoming SEPAR Calendar Dates

Please mark you calendars to attend these upcoming SEPAR activities. Further specific details will follow.

October 24, 2019 Thursday 7:00pm - 9:00pm. Surrey Fire Training Centre

- SEPAR Society Annual General Meeting

November 28, 2019 Thursday 7:00pm - 9:00pm. Surrey Fire Training Centre

- SEPAR Training Night

~ Gord VA7GK

At The SARC Meeting...

September 11 2019

September General Meeting



SARC General Meeting Minutes Sept 11 2019

Attendees: 25

Meeting Start: 7:09pm

Location: Surrey Fire Training Centre

Welcome

Stan welcomed everyone to the Surrey Fire Training Centre and the first meeting back since the summer break.

Several guests visited this meeting and were introduced/welcomed including several new members.

OTC

It's unclear at this point in time the status of our lease. We do not have a container in a location that we can move items into. Discussions are still taking place with the City of Surrey.

JOTA/JOTI

(Jamboree on the Air/Jamboree on the Internet)

Ed Vandeyck attended the meeting to seek support for the 2019 event to be held Saturday, Oct 19th 9am-5pm. JOTA/JOTI are sponsored by Scouts Canada and is an event that runs all over the world. Amateur radio operators are encouraged to get together with scouting groups and get on the air. Our local scout camp, Camp McLean is located on 16th near 200th is being used again this year. Station setup is on Friday and the event is on Saturday. Consider this similar to field day but with kids as operators.

Last year we had 5-6 stations and the kids enjoyed it very much. If you are able to help

volunteer that weekend or setup please contact Ed.

More info can be found here:

<https://www.jotajoti.info>

<https://www.scouting.org/jota/>

<https://www.aldergrovestar.com/community/video-scouts-in-langley-learn-how-to-communicate-during-emergencies/>

<https://www.langleyadvancetimes.com/home/langley-youths-connect-to-the-world-at-annual-scouting-radio-event/>

And be sure to see our previous SARC/SEPAR JOTA efforts at: <https://ve7sar.blogspot.com/search?q=jota>

Invitation to host International ARDF Region 2 in 2021

Les Tocko is looking to determine if there is interest in the local Amateur community to host the International ARDF Region 2 in 2021.

If SARC becomes involved, we would be looking for volunteers to help coordinate and delegate. Due to the scale of the event it would likely require volunteers from several clubs working together.

Referees will be needed and it is estimated that 200-300 people would participate. Accommodations, meals, and transportation would require logistical planning.

Typically, the first two days is training, then 80m, sprint and further days for different hunt categories. The 17 categories broken down by age.

The event requires accessible forested trails in an area of 4km x 4km and not dense brambles or mountainous. The location chosen may not be found in the lower mainland but possibly in

the interior. SARC will gauge interest at this time but more info is needed for volunteer commitment to begin. More information on the ARDF International website: <https://www.iaru-r1.org/index.php/ardf>

Received from Les is some info on the ARDF championship. These are Region 1 rules but Region 2 has adopted them.

ARDF Rules

Part A: http://www.ardf-r1.org/files/Rules_2019_A.pdf

Part B: http://www.ardf-r1.org/files/Rules_2019_B.pdf

Recommendations for organizing the ARDF event check-in:

http://www.ardf-r1.org/files/Guides/ARDF_Event_check_in_v2018.pdf

Protocol guide:

http://www.ardf-r1.org/files/Guides/Protocol_Guide_v2018.pdf

Christmas Party

Jinty reports that this year's Christmas party is on Saturday Dec 7, 2019 at the Guildford Golf Club 7929 152 Street, Surrey, B.C. Doors open at 11:30am with lunch at 12:00pm.

Please Email Jinty via jinty.reid@gmail.com to join the guest list.

You can pay Scott H. at the November meeting. Steve McLean may be accepting payments at the October meeting in Scott's holiday absence. You can also pay online via PayPal using the donate button, noting that it's payment for the Christmas Party. The price per person is yet to be decided but we'd like to get a guest list started now to determine the numbers.

Ham Class

John VE7TI reports that the next Basic Ham Course starts October 8 from 6:30pm-9:30pm, with 7 weeks of instruction. About 22 students are signed up so far.

CW course

Kevin VE7ZD asked about the possibility of a CW course being offered and he volunteered to instruct.

Stan replied that we have tried to get funding for some CW training equipment and continue to do so. Based on member interest it may proceed.

Net Control Manager

Robert VA7FMR has left the position and we are looking for a replacement. Jinty asked if we have a job description.

John VE7TI replied that the primary responsibility of the Net Control Manager is to ensure we have a primary and backup net control operator planned for each week. The net controller would act as a 2nd backup should the need arise. The Net Control Manager is also responsible to ensure the current Net script is available, and to liaise with the SARC Directors if a Net issue arises.

Arduino TNC kit Build Question

John VE7TI replied that Kevin VE7ZD and he have a working prototype but they are still working on a suitable interface given the variety of radio makes and models.

Computer Monitors looking for homes

Please contact Fred VE7IO if you're looking for some used computer monitors.

Bigfoot Tower

Stan VA7NF: We will need to spend ~\$100 for a new battery used to start the generator

---- Break for coffee at 8:05pm@ ----

---- Return from coffee at 9:02pm @ ----

Guest Presentation: Brasspounders

Ms. Lavina Shaw, now in her nineties was our guest presenter. Lavina talked about her experiences working as a railroad and commercial brasspounder (telegrapher) as well as her experiences as a woman working in a man's world. Like many telegraphers of her era, Lavina had a front-row seat to history.

She related stories of her experiences in commercial telegraphy, a position she held for various organizations starting when she first learned the American Morse Code at age 10 in Sifton, Manitoba.

Over her career she worked as a telegrapher for the railroads, news media sending and receiving stories, Time Magazine, and relaying US Presidential

election results. Her top speed was around 60 wpm, and she is still able to do about 30, and practices regularly via a telephone line with other retired telegraphers. The American Morse



Code is slightly different from Morse used by Amateurs. Also known as Railroad Morse, the latter-day name for the original version of the Morse Code developed in the mid-1840s, by Samuel Morse and Alfred Vail for their electric telegraph. The "American" qualifier was added because, after most of the rest of the world adopted "International Morse Code," the companies that continued to use the original Morse

Code were mainly located in the United States. American Morse is now nearly extinct—it is most frequently seen in American railroad museums and "Morse Code" today virtually always means the International Morse which supplanted American Morse.

Another variation was "Phillips' Code. The [Phillips Code](#) is a brevity code (shorthand) created in 1879 by Walter P. Phillips (then of the Associated Press) for the rapid transmission of press reports by telegraph. It defined hundreds of abbreviations and initialisms for commonly used words that news authors and

copy desk staff would commonly use. There were subcodes for commodities and stocks called the Market Code, a Baseball Supplement, and single-letter codes for Option Months. The last official edition was published in 1925, but there was also a Market supplement last published in 1909 that was separate.

The code consists of a dictionary of common words or phrases and their associated abbreviations. In fact, the term POTUS and SCOTUS originated in the code. Extremely common terms are represented by a single letter (C - See; Y - Year); those less frequently used gain successively longer abbreviations (TT—the; Ab - About; Abb - Abbreviate; Abty-Ability; Acmpd - Accompanied).

Later, The Evans Basic English Code expanded the 1,760 abbreviations in the Phillips Code to 3,848 abbreviations.

Lavina was also the first female president of the International Morse Telegraph Club. Their website is at:

<http://www.morsetelegraphclub.org/>

The video featuring our presenter is now available on our blog at: <https://ve7sar.blogspot.com/2019/09/brasspounders.html>

Meeting Adjourned: 9:29pm

~ Jeremy Morse VE7TMY

2019-2020 SARC Directors:

[L -> R] Jeremy, Michael, Anton, Steve,
Jason, Scott, Stan and Don



At The SARC Meeting...

October 9, 2019

October General Meeting



SARC General Meeting Minutes October 9, 2019

Attendees: 20

Meeting Start: 7:05pm

Location: Surrey Fire Training Centre

Welcome

Stan welcomed everyone to the Surrey Fire Training Centre and asked for a health and welfare check. Nothing heard, which is always good news. Tonight Stuart Thornhill will be presenting a talk about his home-built portable back pack radio.

Financial

Scott Hawrelak is absent tonight but Steve McLean is accepting payment for membership dues and Christmas Party tickets.

OTC

Stan reported that, as of yesterday, we have heard that the City of Surrey offers us a shared accommodation within a double wide portable near the OTC. The location has still yet to be inspected by the directors.

JOTA/JOTI

(Jamboree on the Air/Jamboree on the Internet)

It looks like we may be short of volunteers this year, anyone that is able to help out please contact Ed Vandeyck via edvan998@telus.net

Setup is on Friday Oct 18th and the event runs 9am-5pm Saturday. Oct 19th at Camp McLean (200th St and 16th Ave., Langley).

Invitation to host International ARDF Region 2 in 2021

Stan reported that we have not had much interest in hosting this event since we last heard about it in September. There may be some volunteers that would help in certain areas but the event as we understand it is too large of an undertaking for our group to singly host or sponsor.

Christmas Party

Place: Guildford Golf and Country Club, 7929 - 152nd St. Surrey

Date: Saturday December 7th, Time: 11am-2pm.

Menu: Roast Turkey with all the fixings, choice of salads, Apple Crisp & custard, tea & coffee (Vegetarian, contact [Jinty](#)). Alcohol available for purchase. Entertainment will be part of the event. This invitation is also extended to the Langley & White Rock Clubs & SEPAR.

Cost: \$25 per person

Payment Options: Paypal (Select "donation" and write "Christmas event", or cheque/cash will be accepted at the Oct & Nov SARC Meetings.

RSVP to: jinty.reid@gmail.com

Bigfoot Tower

Stan has purchased a replacement battery for the tower.

---- Break for coffee at 7:40pm@ ----

---- Return from coffee at 7:55pm @ ----

Back Pack Radio

Stewart Thornhill VA7SJT is a regular on local repeaters, including our own on Net night. He enjoys walking/hiking with his trusty dog 'Rusty Nail'. To achieve better reception and transmission he designed a backpack from a military frame and outfitted it with his transceiver, comet tri-band vertical antenna and battery. The frame is military standard All-purpose Lightweight Individual Carrying Equipment (A.L.I.C.E.), used by the US military through the 60s and 70s.

One interesting addition is a copper tubing counterpoise inside the plastic portion of his antenna mast. This provides a much better match and improves the efficiency of the antenna.

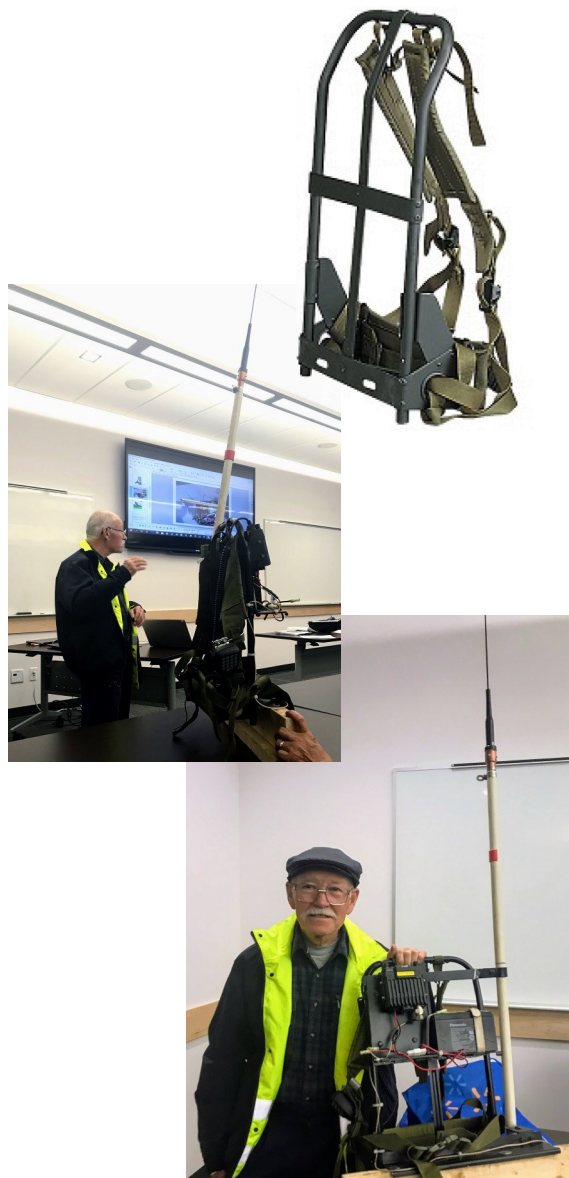
One of his concerns was electro-magnetic (EM) radiation from the antenna. This turned out not to be an issue after measuring the values with an analyzer and checking the Canadian Safety Standards.

Further information is available:

- A program developed by an Australian ham to calculate EM exposure:
<http://www.vk3um.com/emr%20calculator.html>
- A YouTube video:
<https://www.youtube.com/watch?v=dyU8AmsYXqU>
- The EM radiation dosimeter Stewart uses:
<https://www.amazon.com/DT-1130-50Hz-2000MHz-Electromagnetic-Radiation-Dosimeter/dp/B0007JAW40>
- [The military backpack frame](#)

Meeting Adjourned: 8:30pm

~ Jeremy Morse VE7TMY



Social Reminder

The Surrey weekly social gathering is on Saturday at the Kalmar Restaurant at 80th and King George Boulevard between 8 and 10:00 am. You don't have to be a SARC member to participate. Bring your significant other, bring your family, see old friends and have fun.



The hobby endures...

Onno Benschop
VK6FLAB

The hobby of amateur radio has been around for a long time. It was here before I was born and it will be here after I become a silent key. The same is true for you. While there is a recurring discussion about the death of the hobby, the reality is that our community changes continually. People come and go all the time. Reasons for change are as varied as the number of people you care to look at, from interest through to family, from money through to time, from boredom through to excitement, from life through to death.

As our community fluctuates, our skill level varies. We see new people come into the hobby, bright-eyed and bushy-tailed, ready for a new adventure, at the same time we have people who are experienced, or jaded, or both, participating in the community and finding themselves answering the same questions over and over again.

What radio should I get? Is this radio better? How do I do HF? How do I get my license? Where is everyone? How do you participate in a net? Which antenna should I buy? What is a QSO or a QTH? How come this and why that? At some point I was that person and I have no doubt that at some point you were, or are that person.

The challenge in maintaining a semblance of community coherence is to balance the needs for new and aspiring amateurs with the

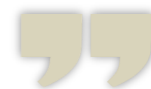
expectations of those already in the community. How do you answer the same questions while staying fresh and encouraging, when all you really want to do is ignore the noise and get on with the hobby?

The answer is simple.

You need to recognize that the change in the hobby is fundamental. New people coming in, new technologies, new hardware, new modes, new rules, new customs, all of it is in flux all the time. It shouldn't be seen as a threat, but as par for the course, something that is part of our community and part of why and how we exist.

To draw an analogy with something else, cooking. We've been doing that for a while, some suggest as far back as 2 million years ago. Every day new people learn to cook, new people invent or reinvent recipes, cooking classes abound, television shows with competitive cooking, new ingredients, new tools, new techniques and relearned old methods, there's celebrity chefs, awards and the more you look at cooking, the more you understand how it changes and continues to change. In many ways cooking and amateur radio are the same.

The idea of teaching your child, or a friend, or a person on social media how to cook something is accepted as how it is and how cooking evolves.



You need to recognize that the change in the hobby is fundamental. New people coming in, new technologies, new hardware, new modes, new rules, new customs...

SARC SOCIETY DIRECTORS 2019-2020

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[president @ ve7sar.net](mailto:president@ve7sar.net)

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[membership @ ve7sar.net](mailto:membership@ve7sar.net)

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[communicator @ ve7sar.net](mailto:communicator@ve7sar.net)

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Heinz Buhrig VA7AQ
15684 102 Avenue
Surrey, BC V4N 2G4

SARC REPEATER MANAGER

[repeater @ ve7sar.net](mailto:repeater@ve7sar.net)

SARC NET MANAGER

Vacant

In amateur radio we can do the same.

It's easy to dismiss silly questions, or to give snide answers, or to ignore new arrivals, but that's not something that grows our community, strengthens it, or broadens it.

Of course, how much you participate in this is the real yardstick of how much of an amateur you really are. Said in another way, if an amateur calls CQ into a dummy load, does anyone care?

One of the challenges as a new entrant into the community is to figure out where to go and how to learn more. It's never been easier than it is today, even if you think that it's hard. In a bygone era you had to go to a library, or to find another amateur, or go to a club to even know that our hobby existed, these days the access to our community is within reach for any person on the planet.

We have endless resources, in the form of web-sites, books, both electronic and paper, clubs, virtual and physical, social media, podcasts and articles such as this, video channels, and an endlessly growing and evolving community that cannot help but document its adventures and exploits.

Amateur radio today is as close as the nearest search engine and as far as you want to take it.

Never be afraid of asking a question and consider it a right of passage if a grumpy bugger tells you off for asking a stupid one.

The worst question is the one you never asked.

~ I'm Onno VK6FLAB

Our Fall 2019 Basic Amateur Radio class started on Tuesday, October 8. We have almost 30 registered with a variety of interests, including Ham radio as a hobby, two Hams retuning after long absences, emergency preparedness (including some members of the Neighbourhood Emergency Preparedness Program—NEPP and outdoors people wanting more reliable communication.

We'll keep you updated on their progress.





November & December

Brrr... Its getting **COLDER** out there!

Please note that we will now be meeting at the Surrey Fire Service Training Centre, a beautiful new facility at 14923 - 64 Avenue, Surrey, BC. Here is a what3words locator and map:

<https://what3words.com/markers.addiction.ozone>

See you on Wednesday, November 13 at 7pm, and hopefully at our Christmas lunch on Saturday, December 7 at 11am.

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228.

On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 or IRLP Node 1737.

We are looking for a SARC Net Manager. Its not a difficult job and, if you have some time to spare, we'd like to hear from you. Basically it involves scheduling someone to do the Tuesday evening weekly net.

	SARC Net 20:00 Hrs
1st Tuesday Standby	VACANT Dixie VA7DIX
2nd Tuesday Standby	Jinty VA7JMR Sheldon VA7XNL
3rd Tuesday Standby	Rob VE7CZV Vacant
4th Tuesday Standby	Kapila VE7KGK John VA7XB
5th Tuesday Standby	Robert VA7FMR John VE7TI
Want a turn at Net Control? Contact the SARC Net Manager	

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hr at the [Surrey Fire Service Training Centre](#),
14923 - 64 Avenue,
Surrey, BC

Weekly SARC Social

Saturday between 0800
and 1000 hrs at the
Kalmar Family Restaurant
8076 King George Blvd.
Surrey

SARC Net

Tuesday at 2000 hr local
on 147.360 MHz (+)
Tone=110.9

SEPARS Net

Tuesday at 1930 hr local
on 147.360 MHz (+)
Tone=110.9

VE7RSC Repeaters

2m: 147.360 MHz +
Tone = 110.9 Hz
IRLP node 1736
Echolink node 496228

1.2m: 223.960 Mhz -1.6
Tone=110.9

70cm: 443.775 MHz +
Tone = 110.9 Hz
IRLP node 1737



We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for SARC.

The price is \$4 each or three for \$10 and they can be picked up at a meeting or the weekly Koffee Klatch.



We thank our sponsors for their support of SARC
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